STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

For forty-eight years—IRON TRADE REVIEW

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he dictates Wire Specifications

. . . for CHAINS must be hard yet tough

Many wires will form easily in a chain machine, but the chain maker required more, a wire that would weld properly, tempered for strength and case harden to resist abrasion. Careful study of chain making and the condition of use of chains enabled us to give the chain maker what he wanted. You, too, have requirements that must dictate as to wire specifications if the wire you use is the best wire for your particular purpose. Wickwire Spencer engineers will similarly study your manufacture and product use and produce a wire for you based entirely upon your dictation as to specifications.

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STEEL
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As the Editor Views the News

IF YOUR company makes any product which can be used advantageously in the construction, finishing or furnishing of a modern American home, we suggest that you make this simple experiment: Ascertain from the chamber of commerce of the nearest large city the statistics for 1932, 1933 and 1934 of (1) number of marriages and (2) number of apartments or dwellings constructed. The figures will show that marriages increased in 1933 and 1934 and are rapidly approaching predepression levels, and that the construction of new living quarters still is practically zero. Remember also that thousands of residences have been razed to save taxes and others are beyond repair.

• • •

Big Market in the Making

You will be convinced that a great revival of building is in the making. The date may be in doubt, but its coming is inevitable. You may not believe it, but many of these new houses will be flat-roofed. The $800 or more saved in the elimination of the gable roof will go into furnishings, including improved heating appliances, air conditioning, refrigeration, plumbing, lighting and electrical gadgets. In brief, the new homes which are to be built in the coming years will represent a market for steel products far more attractive than that provided in the palmiest days of the automobile.

• • •

Get Ready for 1940!

If you admit this to be true, the next step in the experiment is to consider the increase in finishing capacity which has occurred in the steel industry during the past two years. With almost negligible exceptions, the new facilities are for light flat-rolled products, which are adapted to home construction and home furnishings. But the total capacity for these products is tremendous. It is more than adequate to meet any demand that can reasonably be anticipated. There is only one answer to this problem. It is intelligent merchandising. No wonder, then, that alert producers and manufacturers are giving more attention to market research and selling methods. Not surprising, therefore, is the plan adopted by a leading steel producer (p. 24) for training junior salesmen in the hope that they will comprise an effective sales force in 1940.

• • •

Time to Curb A. F. of L.?

If industrialists exercise as much foresightedness in national affairs as some of them display in regard to markets, they will conclude that A. F. of L. has overstepped the bounds of reason (p. 21) in its arrogant dictatorship under the protectorate of the present government administration. The latest rapprochement between A. F. of L. and the new deal (p. 16) looks suspicious. As a result, industry may find that its task of working for a practical solution of the NRA problem and against the unbelievably destructive Wagner disputes bill has been made much more difficult. Spokesmen for employes working under employe representation plans are doing a good job in Washington (p. 10) in emphasizing to members of congress the fact that A. F. of L. is qualified to speak for only a small fraction of industrial employes.

• • •

Auto Output at 1929 Rate

Every user of steel will be interested in the new specifications for steel (p. 28) announced by the Society of Automotive Engineers. The revisions are extensive and important. . . . Fabrication and assembly of the solid top—final step in the attainment of the all-steel automobile body (p. 35)—calls for ingenious application of mass production methods. . . . Employment was greater in February (p. 10), but unemployed in the United States still constitute 40 per cent (p. 22) of the world's jobless army. . . . Automobile assemblies last week were 103,286 (p. 15), highest in any week since Sept. 14, 1929. . . . Heavy melting steel scrap prices are stronger (p. 76) in Pittsburgh.

• • •

We are pleased to introduce in this issue (p. 47) a department devoted to thought-provoking comment by Robert E. Kinkead, who is well known in the field of welding. This will be a weekly feature.

E. L. Shaner

Labor Joins Management in Condemning Wagner Bill

Washington

STEEL was in the vanguard last week when industry, aroused to the highest pitch since the advent of the new deal, descended upon Washington to denounce the Wagner labor disputes bill. Not only producers but representatives of mill labor as well, and metalworking executives, protested the proposal to turn organized labor loose on industry, under the protection of a strengthened section 7a, to coerce labor into joining unions while making any restraint illegal.

As the senate committee on education and labor heard these objections —and they were the most trenchant uttered against any measure at this session of congress—there was considerable speculation backstage concerning the omission of the Wagner bill from President Roosevelt's agenda of "must" legislation for this session.

In conferring with senate and house leaders just prior to departing on his Florida fishing trip early in the week the President stressed these bills: (1) extension of NRA, (2) social security, (3) regulation of utility holding companies, (4) concentration of control over all transportation, (5) increasing capitalization of Home Owners Loan Corp. to $1,750,000,000, (6) bills to reorganize and increase centralization of banking systems, (7) strengthening food and drug acts, and (8) extension of nuisance taxes.

Not on Preferred List

Conspicuously absent are the Wagner bill and the Black-Connery 30-hour work week bill. It would not surprise Washington if the latter fell by the wayside in event NRA is extended with provisions for minimum wage rates and maximum hours retained, but labor's heart is supposed to be set on the Wagner bill, and some underground trading has been rumored.

It may be that placing Philip Murray, vice president of the United Mine Workers, on the national industrial recovery board, thus matching industry's and labor's representation on the board, which directs NRA, and the promised extension of NRA has mollified labor.

On the other hand, Senator Wagner is devoted to his bill, he did not like its being sidetracked a year ago, and his vote for the $4,880,000,000 work relief bill was sorely needed by the President. So the bill's omission from the select list may not be indicative.

At the same time, over the past few months the President has been at pains to indicate to industry that he is treading only a little to the left of the center, and he cannot be unaware that industry's denunciation of the Wagner bill is the most forceful the new deal has yet encountered.

Last week, too, the strike situation was a little more ominous. The American Federation of Labor was concentrating its organization effort upon the rubber industry. Could it draw the veil over Akron, it would shortly cripple the automotive industry, followed by a holdup of specifications from the steel industry's best customer. Thus rubber is the keystone of the industrial arch the A. F. of L. desires to topple. Bituminous coal presents less of a threat because many producers apparently do not regard some stoppage amiss at this time.

It is interesting to note that the labor situation, including disturbances other than those threatened in rubber and also in automobiles and steel as a sequel, is worst in a belt in northern Ohio and reaching around the west end of Lake Erie to lower Michigan. This is also the sector in which the banking holiday was bred.

There is not a little discussion that a brief stoppage of such key industries as rubber and automobiles, with repercussions on the supply industries, would drive home to the country the menace of labor domination of Washington.

Appearing before the senate committee, W. C. Sutherland, vice president, Pittsburgh Steel Co., Pittsburgh, cited 34 years in the steel industry, chiefly directing large numbers of men, as his background.

No Animosity in Past

"My experience," he said, "has always found a decidedly friendly and co-operative attitude between the men and the management of those engaged in the steel industry, and I am sure that condition would prevail in all cases today were it not for the fact that disinterested persons have set out to establish the fact that because one person is an employer and another an employe, they must for that reason be enemies and that legislation must be enacted to provide a means of settling disputes which should never arise and would never arise if the third or disinterested party was not legislated into something where his interests were only of a selfish kind."

Mr. Sutherland told the committee about the employe representation plan of the Bethlehem Steel Co., which, he said, "has been in successful operation for about 15 years."

He stated that "the revised Wagner bill sponsors majority rule and legalizes the closed shop, which would be grossly unfair to the minority group of employes should the majority group in any steel plant or similar industry elect to have a closed shop, as the minority group would be compelled either to join the union and pay dues or be forced out of employment.

"The bill," he continued, "is urged by its advocates as a measure to promote industrial peace but the practical results of its passage would be to set the stage for conflict which would retard national recovery and injure employers and employes, as well as the public."

In concluding Mr. Sutherland told the committee that he is "convinced that the foremost desire of labor in

Unemployment, Month by Month, in Depression

UNEMPLOYMENT in this depression reached its peak at 13,300,000 *persons in March,* 1933, *at the time of inauguration of President Roosevelt and the banking holiday, and has fallen to slightly below* 10,000,000, *according to a revised table computed by the National Industrial Conference board,* 247 *Park avenue, New York.*

Availing itself of revised indices of the bureau of labor statistics the Conference board has used as its base the 3,188,000 *persons idle but able and willing to work, enumerated in the April,* 1930, *census. These* 3,188,000 *persons unemployed in April,* 1930, *were* 6.5 *per cent of the* 48,829,000 *gainful workers in the United States. Monthly unemployment statistics follow:*

(Add 000)

	1930	1931	1932	1933	1934	1935
Jan.	.....	6,667	9,996	12,755	10,538	10,142
Feb.	.....	6,794	10,103	12,782	9,873	9,898
Mar.	.....	6,799	10,293	13,300	9,394	.....
Apr.	3,188*	6,661	10,754	12,993	9,318	.....
May	3,245	6,842	11,090	12,699	9,201	.....
June	3,678	7,165	11,596	12,034	9,252	.....
July	4,321	7,673	12,152	11,584	9,826	.....
Aug.	4,590	7,939	12,207	10,731	9,990	.....
Sept.	4,502	8,044	11,850	9,920	10,217	.....
Oct.	4,777	8,473	11,691	9,924	9,908	.....
Nov.	5,404	9,001	11,996	10,398	10,065	.....
Dec.	5,674	9,182	12,113	10,334	9,740	.....
An. av.	4,375†	7,603	11,320	11,621	9,777	.....

*United States Census of Unemployment, Classes A and B.
†Nine months.

the steel industry today is for an opportunity for regular and steady work, and any legislation, the influence of which will cause a contrary condition, will not be pleasing or beneficial to that large group of people who are most anxious to see the last traces of the industrial depression disappear, and for these reasons I protest against the passage of the revised Wagner bill."

C. S. Traer, vice president, Acme Steel Co., Chicago, attacked the Wagner bill for the reason it seemed "to be predicated upon the assumption that the interests of employe and employer must be antagonistic rather than mutual."

Defeats Sane Solution

"Experience shows," said Mr. Traer, "that when collective bargaining is controlled by professional unions, there is no possibility of using common sense to arrive at an equilibrium between rate of wages and economic conditions."

The witness said that the bill seems intent "on either destroying or greatly crippling employe representation plans." Mr. Traer then told the committee in some detail of the representation plan in vogue in his plant. He said that it was completely vindicated by the steel labor relations board.

In a critical analysis of the bill, E. J. Poole, vice president, Carpenter Steel Co., Reading, Pa., made these six points:

1. The bill proposes a new national labor relations board, subject to politics that may become unfriendly to continued operations and will create strife and retard recovery, and would further project the government into the field of private employment relations.

2. The bill imposes the violation of the majority rule which means that representatives of the majority of the employes have the exclusive right to bargain with management. If an individual or a minority group is not satisfied with its wages, hours, or working conditions negotiated by the majority, there is no recourse or appeal except in the case of grievances.

3. The national labor relations board could intervene in the elections of representatives. It could call special elections when its favorites were out and then refuse to call elections after they were in.

4. The bill provides that the majority may negotiate a closed shop agreement with the employer. If such an agreement were negotiated, all employes would be forced to join the labor organization of the majority or lose their jobs. In plain words, it legalizes closed shop arrangements, under which 49 per cent of the workers could be thrown into the streets unless they joined a labor organiation favored by the 51 per cent.

5. The bill discriminates in prohibiting coercion of employes by employers and not by labor organizations or fellow employes.

6. It does not limit the right to strike, nor require a favorable vote of employes before a strike is called, nor provide a notice to the employer and a waiting period before executing a strike.

Look at the Record!

HOW the national industrial recovery act has fomented trouble between employers and employes is strikingly disclosed in the following comparison of the record 18 *months prior and* 18 *months subsequent to enactment of the act. Of course, some allowance must be made for the fact labor disturbances in the past have always been a concomitant of recovery.*

	18 Months before NIRA	18 Months after NIRA	Per cent increase
Number of disputes	1,258	3,214	155
Working days lost	8,545,360	32,220,144	278
Cost to employes	$26,355,794	$106,323,958	305
Cost to employers	$7,248,143	$29,239,087	305
Cost to public	$156,026,340	$629,437,830	304
Total cost	$189,630,277	$765,000,875	304

Ten groups of workers crowded the hearing room to record their opposition to the proposed legislation, which all of them told the committe would destroy their present plant representation plans of collective bargaining and permit outside organizations, such as the A. F. of L., to enter the plants.

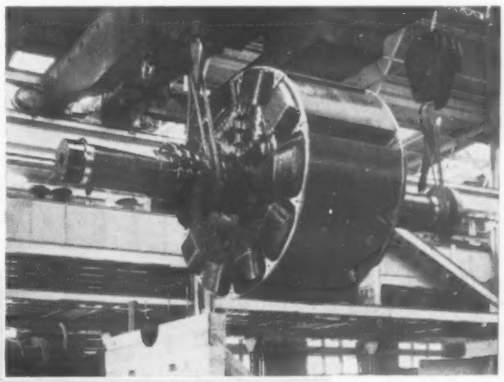
No Bar to Union Coercion

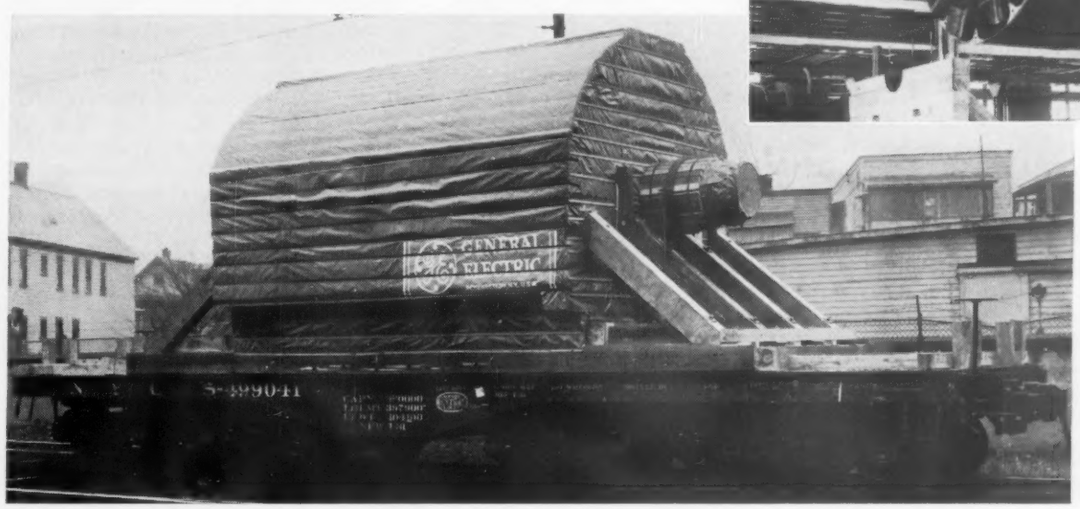
Claiming the bill would "stir conflict" between employers and employes, W. B. Hadden, representing workers in the American Sheet & Tin Plate Co., Vandergrift (Pa.), plant, told the commitee there was nothing in the bill to prevent trades unions from coercing and intimidating employes and forcing them to join unions against their will.

A word picture of bodily harm inflicted upon workers of the Jones & Laughlin Steel Corp. plant at Aliquippa, Pa., was presented by Wil-

(*Please turn to Page* 80)

BELIEVED to be the heaviest single-car shipment ever to leave the General Electric Co. works at Schenectady, N. Y., this generator shaft, rotor and poles for a 25,000*-kilowatt frequency converter set weighs* 367,000 *pounds. A car with four 2-axle trucks was required, total weight of car and load on the rails being* 471,100 *pounds. All clearances on three railroads between Schenectady and Benning, D. C., where the set is being installed in the Potomac Electric Light & Power Co. plant, had to be checked, and some obstructions removed. Inset, the record shipment is being loaded by two cranes*





Production

LACK of railroad and building demand continues the chief handicap of steel producers, depressing the steelmaking rate 1 point last week to 45 per cent. Youngstown, Cleveland, Buffalo and Chicago reported declines last week, while Wheeling and Pittsburgh were the only districts showing improvement. Details follow:

Youngstown—Dipped 8 points to 52 per cent last week, and valley mills are expected to open this week at 50 per cent.

Birmingham—Steady at 55½ per cent last week.

Chicago—Dropped only 1 point to 46 per cent, following decreases of 4 points during each of the two preceding weeks. Mills except to hold ingot production fairly close to its current level during the next 30 days. Fourteen of the district's 36 steelworks blast furnaces are on the active list.

Buffalo—Off 2 points to 35 per cent, with 13 open hearths in production. The usual increase in production that is a seasonal development here with the opening of navigation is not in sight this year.

Wheeling—Up 3 points to 95 per cent, but a 9-point decline to 86 per cent is indicated this week. Although one leading mill is operating at 100 per cent, another producer took off five open-hearth furnaces late last week and will take off a sixth this week. Twenty-nine out of 34 open hearths are scheduled for this week, compared with 35 out of 39 a week ago.

Central eastern seaboard—Unchanged at 28 per cent, with improved operations at two plants offset by slight curtailment at others. Production at the moment appears to be exceeding the rate of new buying; however, it is doubtful if there will be much further reduction at this time. As a matter of fact, an improvement is looked for in April. Contributing to improved operations this month should be production of steel for the large Triboro bridge in New York city, to be supplied by a producer in this district.

New England—Held at 51 per cent last week, with steelworks schedules indicating little change this week.

Cleveland—Lorain—Down 3 points to 67 per cent, National Tube Co., Lorain, dropping two open hearths to operate seven; Corrigan, McKinney Steel Co. adding one to make 11 and Otis Steel Co. continuing with eight.

At the close of last week Corrigan, McKinney was lighting a twelfth open hearth. Sheet mills have dropped to 75 per cent; plate mills to 25.

Pittsburgh—Up 3 points last week to 38 per cent, owing chiefly to the improvement noted in the open-hearth rate of a leading local independent. A large part of ingot production continues to move into semifinished steel for the tin plate and sheet manufacturers. Some slight expansion in ingot operations last week was also traceable to haste in making second-quarter deliveries before April 1. Twenty-two steelworks blast furnaces are operating, a loss of two from a week ago owing to National Tube Co. banking both of its McKeesport, Pa., stacks, at the same time taking off its steelmaking and blooming mill capacity.

Detroit—One producer in this district is operating all eight open hearths, while another has taken two off, holding the rate for this district at 88 per cent. Both producers in this district are stocking semifinished steel.

Steelmaking Operations

Percentage of Open Hearth Ingot Capacity Engaged in 10 Leading Districts

	Week ended Mar. 30	Change	Same week 1934	Same week 1933
Pittsburgh	38	+ 3	36	13
Chicago	46	— 1	48½	13
Eastern Pa.....	28	None	34½	11
Youngstown ..	52	— 8	54	12
Wheeling	95	+ 3	69	†
Cleveland	67	— 3	72	32
Buffalo	35	— 2	52	14
Birmingham...	55½	None	52	12½
New England	51	None	69	†
Detroit	88	None	100	†
	45	— 1	49	15½

†Not reported in 1933.

CANADIAN OUTPUT EASES SLIGHTLY IN FEBRUARY

Canadian production statistics for February:

Steel ingots and castings, 56,006 tons, against 59,526 in January and 57,999 in February, 1934. Two month figures are 115,532 tons for 1935, 118,786 for 1934.

Pig iron, 37,259 tons, compared with 44,416 in January and 12,199 last February. Two month totals are 81,675 tons for 1935, 42,876 tons for 1934.

Ferroalloys, 2700 tons, compared with 2807 in January. For two months of 1935, 5507 tons; for 1934, 3434.

Furnaces in blast Feb. 28: One each at Sault Ste. Marie and Hamilton, Ont., and Sydney, N. S. This was the same as on Jan. 31.

Meetings

EXECUTIVES of the Wire association at a recent meeting in New York voted to hold the annual meeting of the association this year simultaneously with the American Society for Metals, to be held at Chicago, Sept. 30-Oct. 4. In addition to presentation of technical papers, there will be a speaker of national prominence. One day will be devoted to the discussion of nonferrous wiremaking problems and two days to ferrous problems. The new program committee of the association includes Chairman L. D. Granger, assistant to vice president, Wickwire Spencer Steel Co., New York; E. W. Clark, managing engineer, wire department, General Electric Co., Schenectady, N. Y.; and J. C. Ward Jr., Rome Co. Inc., New York.

GRAY IRON MEET IN JUNE

Henry M. Halsted Jr., executive vice president, Gray Iron Founders' society and national code authority for the gray iron foundry industry, has announced an industry meeting to be held June 6 and 7 at Hotel Gibson, Cincinnati.

TO GIVE MARBURG LECTURE

Dr. L. B. Tuckerman, principal scientist, national bureau of standards, Washington, has accepted the invitation of the American Society for Testing Materials to deliver the Edgar Marburg lecture at the 1935 annual meeting of the society to be held in Detroit, June 24-28. His subject will be in the general field of development and application of materials in the aircraft industry.

HOLD TRI-CHAPTER MEETING OF ASM AT DAYTON, APRIL 15

Cincinnati, Columbus and Dayton chapters of the American Society for Metals will hold their anual tri-chapter meeting at the Engineers' club, Dayton, O., April 15. Three papers on the subject of controlled atmospheres in heating metals will be presented at the afternoon session as follows: "Use of Controlled Atmospheres in the Joining of Metals," by H. M. Webber, General Electric Co., Schenectady, N. Y.; "Use of Controlled Atmospheres in Tool Hardening," by S. K. Oliver, Delco Products division, General Motors Corp., Dayton, O.; and "Use of Controlled Atmospheres in Production Heat Treating and Forging," by R. J. Cowan, Surface Combustion Corp., Toledo, O.

Dr. Anson Hayes, director of research, American Rolling Mill Co., Middletown, O., will address the dinner meeting on "Recent Metallurgical Advances." At the evening meeting Dr. V. N. Krivobok, professor of metallurgy, Carnegie Institute of

Technology, Pittsburgh, will repeat the address "Alloys of Iron and Chromium" which constituted the Campbell Memorial lecture at the annual convention of the American Society for Metals in New York last October.

PLANS EXHIBITORS' NIGHT

Purchasing Agents association has announced its "exhibitors' night" for April 23 at the Jefferson hotel, St. Louis. Exhibits will be opened at 2 p. m., followed by dinner at 6, a regular purchasing agents' program, and a general inspection of exhibits.

Science-technology group of the Special Libraries association has scheduled its annual meeting in Boston, June 11-14, at Hotel Statler.

Foreign

GERMANY, now much in the limelight because of its revived martial spirit, is producing more pig iron and steel than any of its nearby European neighbors.

A department of commerce release puts German pig iron production in January at 880,499 metric tons, which compares with 521,200 tons by Great Britain in January, and 507,000 tons in France in November, the latest month for which statistics are available.

Also in January, Germany produced 1,137,463 metric tons of steel ingots and castings, against 757,800 tons by Great Britain and 500,100 tons by France last December.

By way of comparison, in January the United States produced 1,478,443 gross tons of pig iron and 2,834,170 tons of steel ingots.

MACHINE TOOLS TOP EXPORTS BY UNITED STATES IN 1934

Greatest strides in exports of industrial machinery in 1934 were made in the power-driven metalworking machinery group, composed almost exclusively of machine tools, states E. V. Needham, machinery division, department of commerce. A comparison of exports follows:

(000 omitted)

	1934	1933
Power Generating Machinery, except Electric and Automotive	6,598	3,845
Construction & Conveying Machinery	5,533	2,813
Mining, Well & Pumping Machinery	24,201	13,504
Metal working Machinery, Power Driven	19,434	8,158
Other Metal Working Machinery	2,345	1,211
Textile, Sewing & Shoe Machinery	15,449	9,825
Other Industrial Machinery	24,788	15,926
Total	98,348	55,282

Steel in the News

CLAIRE furnace at Sharpsville, Pa., which made headlines 15 years ago when it supplied a test case for the federal trade commission's demand that the iron, steel, coal and coke industry submit monthly reports of cost of production, has passed to the limbo of abandoned furnaces.

This was disclosed last week when the Davison Coke & Iron Co., Pittsburgh, announced its annual report. The book value of the furnace—$437,227—was charged off, leaving Davison a net of $155,385 for 1934 after usual charges, against a loss of $1568 in 1933 prior to depreciation.

After several years in the courts, the trade commission won what was known as the Claire furnace suit, and its right to cost data under a senate resolution was upheld. But so much antagonism had been generated in the industry that the trade commission did not pursue the matter; it was content with a moral victory and a practical defeat.

Claire furnace, built in 1869, rebuilt in 1920-21 and last operated several years ago, had an annual capacity of 200,000 tons of pig iron. Davison also has the Cherry Valley stack at Leetonia, O.; Sharpsville stack at Sharpsville, and the Neville Island stack at Pittsburgh, but in recent years has operated only the latter.

SCRAP SALES TOP NEW STEEL

New York Central railroad's annual report shows that its sales of scrap in 1934 brought in $4,459,125, against $3,962,312 in 1933, and $3,458,740 in 1932. On a tonnage basis it is believed that the road's sale of scrap exceeded its purchases of steel in track material, rolling stock and other forms. It is understood that 1934 sales included 7500 tons of steel axles.

SCHWAB LESS OPTIMISTIC!

Charles M. Schwab, chairman of the Bethlehem Steel Corp., returned from Europe Friday feeling less optimistic than usual. "We don't seem to be progressing much; in fact if the stock market is any indication, we have gone backwards since I left," he declared.

Labor

AVERAGE hourly wage earnings in the steel industry reached the highest level in February since the American Iron and Steel institute began compiling these data. This average was 65.8 cents, compared with 65.5 cents in January.

Total number of employes in February was 420,397, compared with 407,071 in January. Total payrolls in February were $44,212,859, a decline of $115,693 on account of the shorter month. Hours worked per week averaged 35.6, against 33.6 in January.

Capacity

STRUTHERS Iron & Steel Co., Struthers, O., will rehabilitate its Anna furnace at Struthers with a $350,000 6 per cent loan from the Reconstruction Finance Corp., Washington, and expects to resume production in May. The furnace, having an annual capacity of 180,000 tons of pig iron, has been idle four years. It last ran on low phos ore. W. C. Holzworth is president.

NRA

NATIONAL Industrial Recovery board has decided to hold up, for the present, the proposed NRA code for the bolt and nut industry because the basing point system utilized by this industry is similar to that for the iron and steel industry. The President has not yet taken action on the NRA and federal trade commission reports on basing points (STEEL, March 18, p. 22), and presumably the bolt and nut code will be tabled in the meanwhile.

GALBREATH HEADS CODE BODY FOR USED MACHINERY TRADE

Code authority for the used machinery and equipment distributing trade has been approved by NRA. Members approved include M. D. Galbreath, Marr-Galbreath Machinery Co., Pittsburgh; L. E. Emerman, L. E. Emerman Co., Chicago; A. Goldman, Riverside Machinery Depot,, Detroit; J. E. Middleton, L. F. Seyfert's Sons Inc., Philadelphia; C. A. Simmons, Simmons Machine Tool Co., Albany, N. Y., J. E. Launder, Independent Electric Machinery Co., Kansas City, Mo., and J. L. Lucas, J. L. Lucas & Son, Bridgeport, Conn.

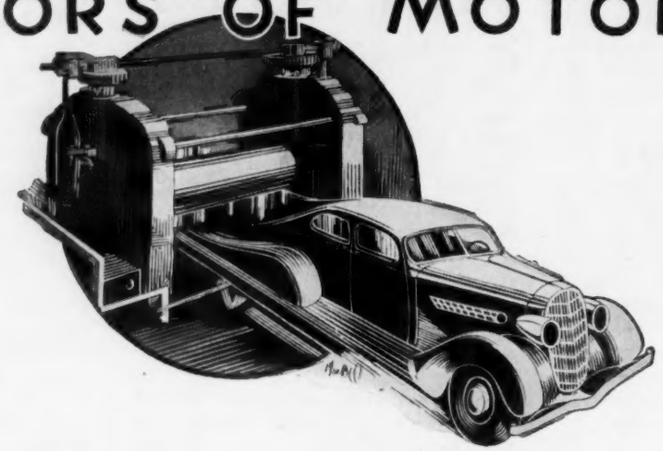
At the organization meeting held in Pittsburgh March 23, Mr. Galbreath was elected chairman of the authority, Mr. Middleton vice chairman, C. L. McDonald, of St. Louis, treasurer, and Ralph S. Davis, of Pittsburgh, executive secretary.

The principal office of the code authority is at 307 Empire building, Pittsburgh.

ZINC CODE IS APPROVED

NRA has consented to the code for the zinc industry, effective April 8. An 8-hour day limitation is placed in the maximum hours provision of the code.

MIRRORS OF MOTORDOM



DETROIT

AUTOMOBILE manufacturers are of one mind concerning bodies. They recognize the merit of steel, and even though the use of a soft top or of wood for certain parts disqualifies all but Hudson-Terraplane from claiming all-steel construction, as noted in this department two weeks ago, most of the remainder are sidestepping this technicality and advertising all-steel (see p. 35).

But springs are another matter. A year ago it looked as if independent front-wheel springing, chiefly with the use of coil springs, was going to sweep the industry, but a number of developments—principally the additional cost of about $20 per car—has granted semi-elliptic leaf springs a reprieve. And are some makers of leaf springs glad that they kept their feet on the ground last year and did not make heavy investments in coil spring equipment!

Calling the roll, Ford stands on the transverse type of spring, both front and rear, which it claims is a form of independent springing. It has achieved improved riding qualities by moving both springs to the outer end of the car, thus increasing what it terms its springbase.

COMPETITIVE PRICES A FACTOR

Chevrolet likes coil springs, or knee action (some engineers regard its design of this type as the best), but cannot afford to absorb the cost. Hence its standard models come equipped with leaf springs, and knee action is $20 extra on the master models.

Indicating that its marriage to knee action is a lasting one—as such things go in the automobile industry—Chevrolet has just completed concentrating at its spring and axle plant in Detroit all of its facilities for manufacturing this type (STEEL, March 25, p. 30).

As an evidence of its difficult position in regard to cost, Chevrolet advertises its prices on the master series on the basis of leaf-spring equipment. This makes it closely competitive with Ford. But Chevrolet salesmen push knee action, and try to get prompt delivery of a master model without it! A master 4-door sedan with knee action delivers in Detroit for $3 more than a Plymouth; with leaf springs, such a sedan is slightly cheaper than Plymouth and only $20 more than a Ford.

SOME DO AND SOME DON'T

Pontiac standard six comes with leaf springs, but the deluxe six and the Pontiac eight have knee action, marking the price range at which makers can afford to install knee action. Olds, Buick, LaSalle and Cadillac—constituting the remainder of the General Motors line—are knee action cars.

Chrysler this year took coil springs off Plymouth and Dodge, principally on account of the cost, but in order to salvage something from its investment of about $500,000 in coil-spring equipment put this type on the DeSoto and Chrysler airstream models.

Hudson-Terraplane has dropped its optional axle-flex suspension and is back to straight leaf springing. So is Nash, except that it has lengthened its front leaf springs to synchronize their movement with the rear springs. Studebaker this year is using a special type of transverse front spring. Packard has adopted coil springs for its small, 120 series, but retains leaf springs on other models.

Packard thus is the only line outside DeSoto and Chrysler airstream and the upper ranges of General Motors to offer coil springs as standard equipment, and Ford and Studebaker are the only exceptions, in the remainder of the field, to leaf springs. The contention, of course, is that moving the engine forward accomplishes the same purpose as coil springs.

General Motors has just issued a booklet, "The Story of Knee Action," calculated to buttress its position as the chief protagonist of this type of springing.

WHEN Chrysler brought out the 1935 Plymouth without coil springs it offered two explanations—it had moved the engine forward and had developed a new molybdenum steel — called Mola — which made a greatly-improved leaf spring.

For a short time Mola was widely advertised—and then it took the veil. Now, it is understood, certain patents have been granted, and a fanfare of publicity and advertising of this steel is just in the offing.

At the Chrysler engineering laboratory in Detroit, C. Harold Wills, formerly with Ford and then for a short time manufacturer of the Wills Ste. Clair, "the molybdenum car," has been working with this new steel for several years. He has what engineers call a complex on molybdenum.

TO CONDENSE SPECIFICATIONS?

At present, this steel is being used by Chrysler only for leaf springs and rear axle drive shafts, but tests are under way on other parts—including connecting rods—and some Chrysler lines are tending to become molybdenum-steel cars.

As a matter of fact, all Chrysler steel specifications are now in the balance. From a total of slightly more than 600, an effort is being made to develop about 20 specifications to cover all the steel needed for a car. General Motors also is attempting to reduce its specifications, now about 215, to several score and to achieve some conformity with SAE numbers.

In this program of concentration on a few steels, Chrysler is endeavoring to build up a continuous Mola series from the carburizing through the oil-hardening grades. One specification would virtually overlap the next one, thus enabling the producers to throw off-heats of one speci-

fication into an adjoining specification.

For the technically-minded, Mola for leaf springs runs as follows: Carbon, 0.58-0.68; manganese, 0.65-0.95; phosphorus and sulphur, maximum of 0.04; silicon, 0.20-0.30; molybdenum, 0.15-0.25. This specification, however, is varied frequently. The Mola specification for coil springs is: Carbon, 0.60-0.65; manganese, 0.70-0.90; phosphorus and sulphur, maximum of 0.04; silicon, 0.20-0.30; molybdenum, 0.15-0.25.

Chrysler has five "approved" producers of its Mola steel—United States Steel Corp., Bethlehem Steel Co., Republic Steel Corp., Timken Steel & Tube Co., and Pittsburgh Crucible Steel Co.—and partsmakers using it have their requirements allocated to a specific maker.

There is considerable speculation in Detroit concerning the derivation of the word Mola. It is said that to Mo, the symbol for molybdenum, have been added the letters "la" to coin a name. There is some basis, however, for believing the "la" stands for aluminum, which is used as a deoxidizer when the heat is tapped.

This addition of aluminum makes for fine grained steel and increases its resistance to impact. Molybdenum also is a grain refiner, principally in the formation of a carbide. Mola steel is produced, it is claimed, without surface decarburization, which gives greater flexing.

Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

	1933	1934	1935
Jan.	128,825	156,907	292,765
Feb.	105,447	231,707	340,544
Mar.	115,272	331,263	410,000*
3 mo.....	349,544	719,877	1,043,309
Apr.	176,432	354,745	.....
May	214,411	331,652	.....
June	249,727	308,065	.....
July	229,357	266,576	.....
Aug.	232,855	234,810	.....
Sept.	191,800	168,871	.....
Oct.	134,683	132,491	.....
Nov.	60,683	78,465	.....
Dec.	80,565	183,187	.....
Year	1,920,057	2,778,739	.....

*Estimated.

Estimated by *Cram's Reports*

Week ended:

Mar. 2	83,899
Mar. 9	86,375
Mar. 16	97,090
Mar. 23	100,065
Mar. 30	103,286

AUTOMOBILE assemblies reached almost a dizzy peak, considering the times, last week when they increased about 3000 units to a total of 103,286, highest for any week since that ended Sept. 14, 1929. This is believed to be the first return to 1929 levels in any major industry.

March thus seems assured a total of approximately 410,000 units, for the United States only, putting the first quarter over the 1,000,000 mark with ease. Not since the second quarter of 1930 has this activity been duplicated.

April opens with most manufacturers tightening up their belts in regard to releases of materials, but this bears more upon May than April assemblies. Barring labor trouble, it appears a safe forecast that April will not vary much from March.

Ford last week pushed up to 6250 units daily, or a total of 37,555 for the week, compared with 36,055 the week preceding. Ford's announced schedule for April is 165,000 cars, which is approximately the March production and compares with 89,249 units in April, 1934.

Chrysler last week held unchanged at 19,950 units for its group, this breaking down into 10,325 Plymouths, 6950 Dodges, 1275 Chryslers and 1400 DeSotos.

General Motors' total last week was 35,600 units, an increase of 1200, accounted for by Chevrolet, now assembling 25,000 units weekly. Other General Motors production is Buick 1500, Cadillac-LaSalle 700, Olds 4200, and Pontiac 4000.

A competitive battle which higher-ups of General Motors are watching with ill-concealed satisfaction is being waged by Oldsmobile and Pontiac. Last year, it will be recalled, Pontiac outsold Olds by the narrow margin of 72,645 to 71,676. This year the race is just as close.

In the first two months of this year Pontiac produced 28,700 units and Olds 24,900. For Pontiac this was a gain of 11,100 over the same period of last year; for Olds an increase of 17,200. The past two weeks Olds has pulled ahead of Pontiac on a weekly basis, the ratio of output being 4200 units to 4000. Pontiac's objective this year is 135,000 minimum, 160,000 maximum; Olds has not stated its program.

The personalities involved are H. J. Klingler, head of the Pontiac division of General Motors, and C. L. McCuen, in charge of Olds. Klingler is a former Chevrolet executive, while McCuen formerly was with Packard and Rickenbacker and designed the F series engine which made Olds a real car beginning with 1928.

What makes General Motors executives glow is that they believe they are meeting the competition of Dodge, which in the first two months of 1935 produced 46,500 units, or not quite so many as Olds and Pontiac combined. It would be cruelty toward these executives to make them say whether Pontiac has nipped off Olds' boast of being style leader of GMC.

Hudson-Terraplane's showing in February was not quite so good as February a year ago from the standpoint of production, but an upturn in the past two weeks put its March total up to 10,000 units, or a third more than in February, and insures a first quarter comfortably ahead of a year ago. Last week, assemblies reached a new 1935 high, at 2746.

Incidentally, Hudson - Terraplane is expected to have a big tool and die program for its 1936 line. This manufacturer revamps its line rather completely every two years, and in the off years effects moderate style changes by building up its old dies. The next series is due for revamping.

FISHER BODY executives and advertising men have been making exhaustive tests in Florida with turret top bodies. It is claimed that with windows closed, the interior temperature went no higher than in soft-top bodies, while with windows opened the steel bodies cooled faster. An advertising campaign to offset any misconception over comfort in steel-top bodies in the summer time is probable . . . . Body parts suppliers for the new low-price Packard have had a tough time with inspectors who have been trying to be as exacting for a $1000 car as for the higher-price Packards . . . . Judging from the unparalleled demand for cars with trunks, especially the 2-door variety, all America is going touring for its vacation this summer . . . .Willys-Overland last week started production of 10,000 cars, expected to keep the Toledo plant going to June 15. This week the Willys plant at Elmira, N. Y., goes on the auction block . . . . Lincoln is remodeling part of its plant, apparently in preparation for the new medium-price car, which is expected to be out this summer but not so early as May, as recently forecast here . . . . Ford's new glass plant will have a daily capacity of 150,000 square feet, all of the safety type. Each Ford car requires 40 square feet, and present consumption at 6000 cars a day is almost 250,000 square feet. The Ford plant will have two continuous production lines, each 600 feet long.

Republic Reduces Deficit

Republic Steel Corp.'s pamphlet report for 1934, released Friday, shows a deficit of $3,459,428 after all charges and expenses, against $4,049,253 in 1933. By quarters, its 1934 experience was: First, loss, $58,862; second, profit, $864,124; third loss, $2,998,600; fourth, loss, $1,266,270. Last year Republic charged off $9,139,901 for repairs and maintenance, $7,839,465 for depreciation and exhaustion.

WINDOWS OF WASHINGTON

WASHINGTON

CHAIRMAN RICHBERG of the national industrial recovery board, overlord of NRA, is bringing to that blue eagle organization—accent on the blue—a period of realism and reorganization.

No more ignominious defeat has been sustained by any government organization than by NRA in the decision to withdraw the Belcher lumber case appeal. Here was a case that NRA thought would be a setup in view of the five to four liberal division of the Supreme Court; it was regarded as the test case most favorable to NRA; it would put Federal Judge Grubb, who has shown little respect for NRA legally, in his place.

But now, ostensibly because a decision cannot be expected much before June 16, when NRA will either pass out or pass on in another form, the case is abandoned. It is believed that Mr. Richberg, who incidentally is now being referred to as chairman instead of merely acting chairman, did not favor such action. It will be recalled that the department of justice also was chary about bringing the Weirton suit at Wilmington, in which Judge Nields knocked out 7a and sustained employe representation plans.

James W. Hook on NIRB?

It should, however, be understood that the lumber code is unique because the government has not supervision over its price control provision. Following the withdrawal of the Belcher suit the lumber code authority has recommended to the industry that its code be suspended, but Mr. Richberg contends this is based upon a misinterpretation of the department of justice's action.

As to reorganization, NIRB continues in an unsettled state, largely because no successor to Arthur D. Whiteside, an industry representative, has yet been selected. James W. Hook, president, Geometric Tool Co., New Haven, Conn.; Charles E. Adams, president, Air Reduction Co., New York, and R. Douglas Stuart, vice president, Quaker Oats Co., Chicago, are being considered.

As will be recalled, with the appointment of William P. Witherow last week, industry now has two representatives on the board (Witherow and Whiteside), and with the selection of Philip Murray, United Mine Worker vice president, labor also has two representatives (Sidney Hillman and Murray).

Administration Bill In

A generally unsettled atmosphere continues to pervade NRA headquarters as the senate finance committee has completed its third week of hearings and so far has got no place. Most of the past week was devoted to discussing the clothing industry code. Senators are gettting restive over the prolonged investigation.

Senator Pat Harrison, chairman of the senate finance committee, and Representative Doughton, chairman, house ways and means committee, on Friday introduced identical bills extending NRA for two years.

In general, the bills, as evxplained by Senator Harrison, carry out the President's proposal in his message, and serve as a basis for discussion. The bills delete division 3 of section 7a, this division stating: "employers shall comply with the maximum hours of labor, minimum rates of pay, and other conditions of employment, approved or prescribed by the President". The significance of this was not quite clear Friday.

Prior to leaving on his Florida fishing trip, the President cited a two-year extension of NRA as an essential part of his legislative program. There are whispers on Capitol Hill that the President has promised progressives he favors eliminating price control provisions and restraints on production from the proposed new NRA. But there also are whispers that a number of industries including steel, would throw up a code restricted to maximum hours and minimum wages. The bills introduced Friday are not believed to satisfy the progressives.

Just before the President left for the South, Mr. Richberg called his attention to the fact that "in some sections of the country and in some industries violations have been increasing in the wage and hour provisions of the codes because of the mistaken feeling that NRA may not be extended and that the government may not be inclined at the present time vigorously to enforce codes."

The President was very specific in his answer, saying that it is his desire "that the full power of the NRA shall be exerted to insist upon and to obtain compliance with the requirements of approved codes."

Might Step on War Dept.

The Colt's Patent Firearms Mfg. Co., Hartford, Conn., handed NRA a jolt last week when it notified the compliance division that it will not heed the national labor relations board order directing the company to recognize a shop committee of employes representing labor unions at the plant as the exclusive agency for collective bargaining for all employes.

The war department will become interested in event the compliance division snatches the blue eagle away from Colt's, inasmuch as it is a large supplier of munitions, and it is no secret that reserve supplies of munitions are not being permitted to decline.

STEEL LABOR BOARD STYMIED; LIFE DEPENDS ON NEW NRA

Action by the national steel labor relations board is practically at a standstill because of the various court cases now pending—none of which has yet been adjudicated.

It has to be remembered, also,

that this board was organized through an executive order of the President through powers given him under the recovery act. Therefore this board goes out of existence on June 16, when NRA act expires, unless some provision is made for its continuance either by congress and by Presidential order.

On Friday the board postponed from April 3 to April 9 a hearing on the petition for an election at the South Chicago, Ill., works of the Republic Steel Corp. It also heard the third argument in connection with alleged discrimination against 27 employes at the Gadsden, Ala., plant of the Gulf States Steel Co.

Incidentally, in addition to the Wagner bill (see page 10) and the 30-hour week bill, previously mentioned, these bills before congress apply drastically to industry:

By Senator Byrnes. Makes a felony of the transporting, in interstate commerce, of persons to be employed to obstruct or interfere with the right of peaceful picketing during labor controversies.

By Senator Van Nuys. Prohibits employers from influencing the vote of their employes in connection with any presidential or congressional election.

By Representative Connery. Would require state authorities to secure the consent of the secretary of war before federal equipment could be used by the state national guard in case of industrial trouble; to place representatives of national unions on all boards or agencies of the government which executive laws dealing with workers.

S. 2211 *and H. R.* 6618. These companion bills would make it unlawful for any person engaged in commerce to fix or quote prices except prices at the factory or point of shipment, or to sell such goods for a price fixed on any other basis unless the purchaser specifically requested that it be fixed on the basis of delivery at a particular destination.

NEELY PAINTS SHORT WEEK AS "HOPE OF MILLIONS"

In reporting out favorably the Black 30-hour week bill from the committee on the judiciary, Senator Neely, of West Virginia, says that it will affect employes in the following industries: (1) Industries borrowing money from governmental agencies, (2) industries and their subcontractors making contracts for services to be performed with the United States government, (3) industries actually engaged in interstate commerce, and (4) industries operating under codes approved by a governmental agency.

In making the report the senator from West Virginia states that "a shorter work week and work day will restore happiness and hope to millions who will be given employment. The bill, if passed, will increase production throughout the nation. It will put idle men and idle machines to work. It will support our idle toilers with work instead of taxes."

In connection with opposition to the bill, Senator Neely says that "the most vigorous opposition to the bill has been voiced by the interests which, last March, through the code authorities, rejected the President's recommendations for shorter hours and higher wages.

"The dominant banking groups of the country and many of our industrial leaders are still thinking in terms of the dazzling but disastrous 1920's. The compulsory adoption of shorter hours for industrial workers without reduction in wages is considered by some of our powerful industrial and financial leaders as an unwarranted infringement upon the profits of the present and a menace to the profits of the future."

HEAR REVISED STRUCTURAL CODE FAILS TO SATISFY

The structural steel code, which has been under discussion at NRA since last July, is still unsettled.

As reported in these columns two weeks ago, the code was redrafted and copies of the new draft were submitted to the various advisory boards of NRA.

It is now reported that these boards have completed reading of this new draft and that the reports have been submitted to Major Campbell, deputy administrator in charge of the negotiations.

On the very best authority, it is understood that the reports are unfavorable to the code as redrafted, but no one at NRA will discuss the matter at this time and nothing further will be done until the return to Washington of Major Campbell this week.

WEAKNESS OF BELGA PUTS TRADE PACT IN JEOPARDY

While nothing official has been made public, there is a general feeling that the trade agreement between the United States and Belgium will not become effective because of the changed financial situation in that country.

It has been reported for some time that the iron and steel industry was not satisfied with the deal it got in the trade agreement and while no protests were filed, according to state department officials, no tears will be shed by the industry if the agreement does not become effective. (See STEEL for March 4, p. 30).

On Thursday a trade agreement was signed between this country and Haiti. Included is a clause to the effect that the favorable Haitian customs treatment for iron and steel pipe and fittings will not be changed during the life of the agreement.

Died:

FRANK L. MORSE, 70, president of the Morse Chain Co., Ithaca, N. Y., and owner of many patents on chain drive mechanisms, in Orlando, Fla., March 25. He remained president of Morse Chain when it was taken over by the Borg-Warner Corp., Chicago, in 1929, and was a director of the latter. He was a member of the Engineers club, New York, and various technical societies.

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Eben S. S. Smith, 62, formerly president of the Keith Car Mfg. Co., Sagamore, Mass., in that city, March 25.

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Leopold F. Koeber, 58, president of the Koeber Iron Works, Cleveland, and one of the best known ornamental iron workers in that district, in Cleveland, March 24.

♦ ♦ ♦

A. F. Bennett, 79, former secretary of Crane Co., Chicago, in Northfield, Mass., March 21. He joined the company as auditor in 1890, retiring in 1915.

♦ ♦ ♦

Forrest E. Barter, superintendent of the Carborundum Co. plant in Niagara Falls, N. Y., in that city, March 23. He had been with the company for 18 years.

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Carl J. Bentzen, 67, for 15 years manager of the Young & Vann Supply Co., Birmingham, Ala., in that city, March 16.

♦ ♦ ♦

Charles L. Lee, 65, well known for his automotive appliance inventions, in Dayton, O., March 24. He was credited with originating or developing more than 1000 products and processes, including a method of brazing copper to cast iron.

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Charles A. Adams, 39, a director and plant superintendent of Mathews Conveyer Co., Ellwood City, Pa., in that city, March 23, after a week's illness. He had been in the employ of the company since 1912, filling key positions in both manufacturing and engineering departments. He was active in civic affairs of Ellwood City.

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George M. Wolff, 64, president of the George M. Wolff Co. and the Triplex Supply Co., Milwaukee, manufacturers' representatives in metal cutting tools and associated equipment, March 24. After 22 years in the purchasing department of Allis-Chalmers Mfg. Co., Milwaukee, he established his own business in 1911, gaining a wide acquaintance in middle western metalworking shops.

Industrial Men in the Day's News

C. B. Nolte, New President, Crane Co.

A graduate in mechanical engineering, for over 25 years he has been active in consulting work.

He leaves the presidency of a leading organization of consulting, testing and inspecting engineers.

A member of numerous technical societies, he brings a spirit of scientific control to his new position.

C. B. NOLTE, president of the Robert W. Hunt Co., Chicago, consulting, testing and inspecting engineer, has been appointed president of Crane Co., Chicago, succeeding J. B. Berryman, president since 1931, who now becomes chairman of the board.

Mr. Nolte is a graduate in mechanical engineering from the University of Illinois, and became associated with the Hunt organization in 1909. Successively he became division manager, manager, vice president and general manager, and president.

He is a member of the American Society of Civil Engineers, American Society of Mechanical Engineers, American Society for Testing Materials, American Railway Engineering association, Western Society of Engineers and the Pacific Railway club.

He has been a director of Crane Co. and member of the executive committee over the period of the past three years.

James C. Ogden, vice president of the Hunt company and identified with the organization for over 35 years, succeeds Mr. Nolte as president.

S. H. BLACKWOOD, formerly assistant district sales representative in the New York territory for Reading Iron Co., Philadelphia, has been named district sales representative in southern territory with headquarters in Baltimore. He succeeds W. J. White, recently resigned.

W. N. Johnson has been appointed salesman in the New York territory for Reading Iron.

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Thomas O'Brien, who retired last month as general manager of the Gary, Ind., plant of American Sheet & Tin Plate Co., and his former assistant, William T. Hugus, recently named to head the industrial relations department of the company, were honored at a banquet in Gary, March 23, arranged by their associates and attended by officials of the company.

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Edmund Claxton, director of research for the Armstrong Cork Co., Lancaster, Pa., has been elected a director of the company, succeeding Fowler Manning, American Radiator & Standard Sanitary Mfg. Co., New York.

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W. W. Powell, general sales manager, and J. R. Berg, general superintendent, Mesta Machine Co., West Homestead, Pa., have been elected directors of the company to succeed C. M. Higbie and J. C. Horning.

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Armand H. Peycke, recently elected a vice president of American Steel Foundries, Chicago, has been associated with the company since 1912. For a number of years he has been in charge of the spring and brake beam departments. He will continue as president of the Damascus Brake Beam Co., with headquarters at Chicago.

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H. R. Peck heads a new building materials division of Armstrong Cork Products Co., Lancaster, Pa., inaugurated to concentrate sales effort on the company's products for the building field. Mr. Peck has been associated with the company for 15 years.

G. C. Denebrink, experienced in sales and merchandising activities of the company, is assistant general manager of the new division, which will be made up of six co-ordinated departments, headed up by the following:

T. R. Nunan in charge of low-temperature insulation, including corkboard, cork covering and materials required for their erection.

J. L. Allison in charge of high-temperature insulation, including insulating brick and other products used in industrial furnaces.

L. E. Cover in charge of fiberboard insulation products for residential and general building construction.

H. D. Stewart in charge of floor tile.

R. H. Craig in charge of acoustical materials.

J. C. McCarthy in charge of linoleum-type wall covering.

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W. H. Spooner, for the past 18 years associated with Archur C. Harvey Co., Boston warehouse distributor, has been appointed New England district sales manager for Central Iron & Steel Co., Harrisburg, Pa., his headquarters to remain in Boston, Statler Office building.

W. H. Spooner

□ □ □

Frank E. Blanchard, formerly manager of sales, southeastern

states, for the Climax Engineering Co., Clinton, Iowa, is now associated with Caterpillar Tractor Co., Peoria, Ill., special sales department. He had been connected with the Climax company in sales executive capacity for over nine years.

♦ ♦ ♦

William W. Coleman, president, Bucyrus-Erie Co., South Milwaukee, Wis., has sailed for Europe for a stay of five weeks, during which time he will attend the annual meeting of the Bucyrus-Ruston Co. Ltd., British affiliate.

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Walter V. Flood has been elected a director of Electric Auto-Lite Co., Toledo, O. Other directors, as well as officers have been re-elected, with John Shotwell named assistant treasurer and Paul J. Dailey assistant secretary.

A Sign of the Times

A WEEK ago last Sunday night—March 24—several hundred Pittsburghers became so worried over two long reddish streaks in the western Pennsylvania skies that they anxiously telephoned newspapers and the Allegheny Observatory, fearing comets, doomsday or portent of war. In fact, most asked, "Do they mean war?"

Z. Daniel, assistant astronomer at the Observatory explained: "Only the sign of better times. The streaks are the reflection of more blast furnaces in operation—the light from the furnaces is being oddly reflected on frost crystals."

Financial

YOUNGSTOWN SHEET & TUBE CO., Youngstown, O., substantially increased its sales and decreased its losses in 1934. Sales in 1934 amounted to $63,138,122, compared to $49,436,510 in 1933. The company showed loss of $2,665,119 in 1934, against a deficit of $8,342,901 in 1933.

Net profit from operations before providing for depletion of minerals and depreciation of plants, interest and other charges, rose from $4,634,686 in 1933 to $7,339,048 in 1934.

In 1934 the company spent $10,763,898 for plant improvements and betterments designed to increase the company's production efficiency and improve its competitive position.

INLAND NET RISES SHARPLY

Pamphlet report of the Inland Steel Co., Chicago, shows net income in 1934 after charges was $3,729,889, equivalent to $3.10 per share. In 1933 the net was $166,693. In 1934 operations averaged 53.1 per cent, against 42.3 in 1933.

NATIONAL TO PAY EXTRA

National Steel Corp., Pittsburgh, has declared an extra dividend of 12½ cents per share on the common, in addition to 25 cents regular, payable April 30 to record of April 20. A similar extra was paid the quarter previous.

OTHER FINANCIAL REPORTS:

Pittsburgh Screw & Bolt Corp., Pittsburgh, 1934, net of $228,696; 1933, loss of $143,700.

United Engineering & Foundry Co., Pittsburgh, 1934, profit of $718,395; 1933, net of $401,018. Stockholders will vote April 23 on a 2-for-1 splitup of common stock.

Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., 1934, net loss of $15,838; 1933, deficit of $363,242.

Duff-Norton Mfg. Co., Pittsburgh, 1934, net of $47,832; 1933, a deficit of $11,247.

Standard Steel Spring Co., Coraopolis, Pa., 1934, net of $110,792, had first profit in four years; 1933, deficit of $172,908.

Mesta Machine Co., Pittsburgh, 1934, net profit of $1,517,250, after charges; 1933, net of $630,678.

American Steel Foundries, Chicago, 1934, profit of $245,365; 1933, loss of $1,400,640.

Mullins Mfg. Co., Salem, O., 1934, net profit of $186,504; 1933, loss of $268,427.

Lamson & Sessions Co., Cleveland, 1934, net loss of $129,060; 1933, profit of $40,555.

National Acme Co., Cleveland, 1934, net of $140,328; 1933, loss of $311,056.

Midland Steel Products Co., Cleveland, 1934, profit of $680,656; 1933, profit of $672,728.

Marion Steam Shovel Co., Marion, O., 1934, loss of $215,287; 1933, loss of $570,562.

Niles-Bement-Pond Co., New York, 1934, net of $25,485; 1933, loss of $276,643.

Minneapolis-Moline Power Implement Co., Minneapolis, 1934, loss of $2,172,999; 1933, loss of $1,544,566.

J. D. Adams Mfg. Co., Indianapolis, 1934, profit of $279,014; 1933, profit of $73,813.

RESUMES ON PREFERRED

Wheeling Steel Corp., Wheeling, W. Va., will pay 50 cents on its 6 per cent cumulative preferred stock April 1 to record of March 12. The last previous payment was 75 cents on Jan. 2, 1932. Estimates are that

¶Vanadium-Alloys Steel Co., Pittsburgh, has declared a 25-cent common dividend, payable April 10 to April 1 record.

Woody Made Chairman of N. E. Ohio Foundry Chapter

Foundrymen from northeastern Ohio met at Cleveland, March 25, and voted to petition the American Foundrymen's association for affiliation as a chapter in that section, to be known as the northeastern Ohio chapter of the A.F.A.

The following officers were elected: Chairman, Walton L. Woody, National Malleable & Steel Castings Co., Cleveland; vice chairman, Frank G. Steinbach, managing editor, *The Foundry;* secretary-treasurer, R. F.

Named Heads of Gulf States Promotion Department

R. W. Frawley

N. G Bradford

Who as noted in STEEL for March 25 have been appointed manager and assistant manager, respectively, of the newly-created sales promotion department of Gulf States Steel Co., Brown-Marx building, Birmingham, Ala. Both men have been associated with the Tennessee Coal, Iron & Railroad Co., and each has about 30 years' experience in steel sales in the South.

Lincoln, Osborn Mfg. Co., Cleveland; directors for 1 year, R. W. Parsons, Ohio Brass Co., Mansfield, O.; Charles Seelbach, Forest City Foundries Co., Cleveland; A. C. Denison, Fulton Foundry & Machine Co., Cleveland; directors for 2 years, J. H. Bruce, Bowler Foundry Co., Cleveland; William Gluntz, Gluntz Brass & Aluminum Co., Cleveland; B. G. Parker, Youngstown Foundry & Machine Co., Youngstown; directors for 3 years, Ralph H. West, West Steel Casting Co., Cleveland; R. E. Williams, Chicago Pneumatic Tool Co., Cleveland; and L. P. Robinson, Werner G. Smith Co., Cleveland.

Donald J. Reese, of the Whiting Corp. and chairman of the Chicago chapter, delivered an interesting talk following the dinner on the accomplishments of the Chicago group since affiliation with the national society. Dan M. Avey, editor, *The Foundry*, Cleveland, and president of the A.F.A., spoke of the service which the association has rendered the foundry industry and pointed to the possibilities of greater foundry progress through the local chapters.

Harry W. Dietert, chief engineer, the U. S. Radiator Co., Detroit, presented a paper on several properties of molding sand, including flowability, expansion, contraction, and deformation. Mr. Dietert stressed particularly the research work on sand carried on during the past year.

UNITED STATES IMPORTS OF IRON AND STEEL PRODUCTS

Gross Tons

Items	Feb., 1935	Jan., 1935	Feb., 1934
Pig iron	10,741	2,033	10,777
Sponge iron	.....	257	28
Ferromanganese and spiegeleisen (1)	2,749	2,630	2,729
Ferrochrome (2)	.....	.....	17
Ferrosilicon (3)	88	213	28
Other ferroalloys (4)	.....	1	.....
Scrap	2,790	2,415	4,343
Steel ingots, blooms, etc.	467	99	67
Concrete bars	.....	109	229
Hollow bar, drill steel	55	50	48
Merchant steel bars	1,604	2,210	1,254
Iron slabs	.....	.....	.....
Iron bars	119	58	26
Wire rods	952	775	864
Boiler and other plate	19	10	6
Sheets, skelp, saw plate	546	321	348
Tin plate	10	4	2
Structural shapes	1,885	3.569	1,523
Sheet piling	.....	.....	.....
Rails and fastenings	407	211	186
Cast iron pipe fittings	.....	.....	1
Malleable iron pipe fitgs. (5)	.....	37	.....
Welded pipe	132	21	221
Other pipe	1,247	1,669	279
Barbed wire	2,217	1,684	347
Round iron, steel wire	224	415	147
Telegraph, telephone wire	.....	.....	.....
Flat wire, strip steel	103	112	184
Wire rope and strand	113	193	103
Other wire	67	146	64
Cotton ties	12	80	.....
Other hoops, bands	1,234	2,207	1,040
Nails, tacks, staples	966	993	414
Bolts, nuts, rivets	22	36	25
Horse and mule shoes	42	82	10
Castings and forgings	94	144	97
Total	28,905	22,784	25,407

(1) Manganese content.
(2) Chrome content.
(3) Silicon content.
(4) Alloy content.
(5) New class. No comparable figures for 1934 and previous years.

February Imports Up, Exports Down

IRON and steel products exported from the United States in February totaled 228,537 gross tons, compared with 262,740 gross tons in January, a decline of 13 per cent, the second consecutive month registering a loss, according to figures compiled by the iron and steel division of the bureau of foreign and domestic commerce, Washington. However, the February export total is 51 per cent higher than for February, 1934.

FOREIGN TRADE OF UNITED STATES IN IRON AND STEEL

Gross Tons

	1935		1934	
	Imports	Exports	Imports	Exports
Jan.	22,784	262,740	22,653	178,023
Feb.	28,905	228,537	25,407	151,184
2 Mo.	51,689	491,277	48,060	329,207
Mar.	.....	.....	38,393	261,269
April	.....	.....	26,862	201,539
May	.....	.....	29,465	241,753
June	.....	.....	24,848	219,406
July	.....	.....	17,676	233,186
Aug.	.....	.....	32,418	242,947
Sept.	.....	.....	23,847	301,330
Oct.	.....	.....	20,202	220,209
Nov.	.....	.....	35,272	299,263
Dec.	.....	.....	19,708	282,655
Total	.....	.....	316,761	2,832,764

Shipments of iron and steel scrap declined 17,810 gross tons and black sheets 5213 tons, these two items accounting for the greater part of the month's loss.

Imports in February totaled 28,905 gross tons, an advance of 26.8 per cent over the 22,784 tons imported in January and 13.7 per cent over February, 1934. An increase of 7992 tons in pig iron receipts accounted for the higher February figure, resulting from resumption of participation by the Netherlands after several months absence. Imports of structural shapes declined 1684 tons.

Scrap retains its position as the leading article of export in spite of its decline of about 10 per cent from January. Of the 151,720 gross tons exported, Japan took 76,830 tons, Italy 33,269 tons, United Kingdom 23,331 tons, and Mexico 5853 tons.

Iron ore exports were negligible in February, only 154 tons, to Canada, compared with 1958 tons in January.

ORIGIN OF FEBRUARY IMPORTS

Gross Tons

	Pig iron	Manganese ore	Ferromanganese
Netherlands	6,759	.....	.....
Norway	345	.....	1,336
Canada	892	.....	934
British India	2,745	118	.....
Soviet Russia in Europe	.....	10,749	.....
Chile	.....	125	.....
Gold Coast	.....	2,878	.....
France	.....	.....	68
United Kingdom	.....	.....	268
Italy	.....	.....	143
Total	10,741	13,870	2,749

	Sheets, skelp and sawplates	Structural steel	Steel bars	Hoops and bands
United Kingdom	2	2	36	.....
Belgium	230	1,273	814	439
France	17	571	410	588
Germany	292	39	103	202
Sweden	5	.....	220	5
Canada	.....	.....	18	.....
Austria	.....	.....	2	.....
Czechoslovakia	.....	.....	1	.....
Total	546	1,885	1,604	1,234

UNITED STATES EXPORTS OF IRON AND STEEL PRODUCTS

Gross Tons

Commodity	Feb., 1935	Jan., 1935	Feb., 1934
Pig iron	284	261	326
Ferromanganese, spiegesleisen	.....	3	6
Iron and steel scrap	151,720	179,630	75,884
Tin plate scrap (1)	2,894	4,209	.....
Waste-waste tin pl. (1)	1,718	2,273	.....
Ingots, blooms, billets, slabs, sheet bars	5,330	3,221	679
Bars, iron	34	233	58
Bars, steel	5,126	4,745	3,348
Bars, alloy steel	281	154	163
Wire rods	1,681	3,279	1,190
Boiler plate	143	44	78
Other plate, not fab.	3,797	1,933	2,689
Skelp, iron or steel	1,171	373	817
Iron sheets, galvanized	56	99	81
Steel sheets, galvanized	6,178	5,324	4,263
Steel sheets, black	6,953	12,166	4,912
Iron sheets, black	468	401	157
Strip steel, cold-rolled	1,293	1,297	892
Strip steel, hot-rolled	2,219	1,475	992
Tin plate, taggers' tin	10,266	14,954	16,512
Terne plate (1)	266	282	.....
Water, oil, gas and other tanks, exc. lined	501	774	1,648
Shapes, not fabricated	2,210	1,663	1,505
Shapes, fabricated	1,489	1,152	1,047
Plates, fabricated	71	42	237
Metal lath	44	15	86
Frames, sashes and sheet piling	637	559	417
Rails, 50 pounds	1,181	897	10,648
Rails, under 50 pounds	8	103	463
Rail fastenings	281	303	1,654
Switches, frogs, crsgs.	142	138	98
Railroad spikes	231	232	631
Railroad bolts, nuts	40	42	332
Boiler tubes, seamless	307	792	485
Boiler tubes, welded	13	40	69
Casing and oil line pipe, seamless	3,392	2,460	2,967
Casing and oil line pipe, welded	1,074	1,387	596
Seamless black pipe, other than casing, etc.	571	211	167
Malleable iron screwed pipe fittings	184	269	238
Cast iron screwed pipe fittings	116	178	174
Cast iron pressure pipe, fittings	1,865	360	628
Cast iron soil pipe, fittings	394	280	591
Welded black steel pipe	1,320	1,788	1,105
Welded black wrought iron pipe	265	119	86
Welded galv. steel pipe	1,815	2,407	1,668
Welded galv. wrought iron pipe	63	25	137
Riveted iron or steel pipe and fittings	60	56	3
Plain iron, steel wire	1,039	1,819	836
Galvanized wire	853	1,401	2,538
Barbed wire	2,249	2,562	3,214
Woven-wire fencing	64	162	110
Woven wire screen cloth	74	100	59
Wire rope	319	231	120
Other wire and mfrs.	306	365	313
Wire nails	548	783	966
Horseshoe nails	47	74	67
Tacks	27	36	45
Other nails, staples	231	239	263
Bolts, machine screws	574	438	398
Iron castings	564	849	814
Steel castings	231	116	61
Car wheels and axles	695	489	391
Horseshoes	21	1	1
Iron and steel forgings n. e. s.	543	427	261
Total gross tons	228,537	262,740	151,184

(1) New classifications. No comparable figures for 1934 or previous years.

EDITORIAL

Why Suffer This Arrogant Dictatorship of A. F. of L.?

EVENTS of the past few days justify a careful consideration by industry of the implications of the present status of the union labor lobby in Washington. The evidence indicates that while the new deal administration probably cannot be described as an A. F. of L. government, it is dangerously near to it.

No one seems to know exactly what kind of a horse trade was consummated in the negotiations which effected an armed truce between Donald Richberg and John Lewis—or rather between the Roosevelt administration and the A. F. of L. However, it is certain that concessions of substantial character must have been made to induce the czar of the miners' union to make peace ostensibly with the man whom he previously had branded publicly as a "Judas" to the cause of professional union labor.

What was the concession? Was it the placing of Philip Murray, vice president of the United Mine Workers, on the national industrial recovery board?

Did the administration promise White House support for the Wagner labor disputes bill? Or did it pledge further assistance to A. F. of L. in some other direction in exchange for the precious good will of Messrs. Green, Lewis et al.?

Industry will be eager to know the answers to these questions. If the new deal has sold out lock, stock and barrel to the A. F. of L., industry should be cognizant of that fact.

A. F. of L. Examines All Bills and Molds Many To Serve the Selfish Interest of Its Leaders

Even before the peace between Richberg and Lewis was patched up, it was apparent that A. F. of L. had usurped an important share of the administrative and legislative prerogatives of the government. It is not an exaggeration to say that every bill presented since March 4, 1933, has run the gauntlet of A. F. of L. sharpshooters. In the case of many of the more important acts passed in the last two sessions of congress, A. F. of L. has been successful in inserting jokers for the purpose of strengthening the power of the professional unions or giving them a cushion of immunity from responsibility for their acts.

Consider some of the consequences of this situation. Everyone knows the extent to which A. F. of L. attempted to mold the administration of NIRA to its own advantage. Some well informed observers of Washington affairs know that A. F. of L. influence successfully thwarted the efforts of at least one important industry to obtain a code. In the winter of 1933-1934, the favoritism accorded bona fide and fictitious members of professional unions by the federal emergency relief administration fell short of becoming a national scandal by the narrowest of margins. Discrimination in favor of holders of union cards has been a common occurrance in the handling of PWA projects.

Moreover, the influence of these acts of favoritism—condoned and in some cases brazenly encouraged by the federal administration—has affected the political status of A. F. of L. locally. In many of the larger cities, the municipal authorities make no effort to conceal their support of A. F. of L. strikers. Police will assist an A. F. of L. picket line, enabling a minority to prevent a majority from working.

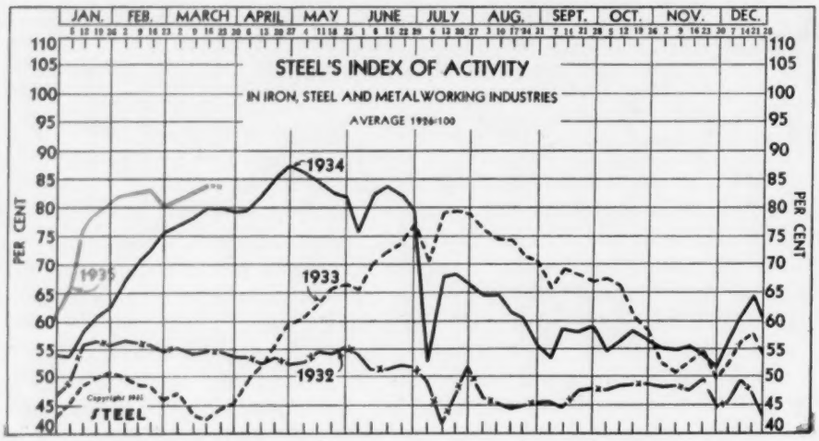
Public Officials Have Deserted Unaffiliated Worker; They Lick Boots of A. F. of L.

God help the unaffiliated worker in a plant in many of the politically-wrecked large American cities! His mayor, his representatives in the city council, his representatives in the state capitol and his governor, his congressman and senators at Washington and his federal government itself will not lift a little finger in defense of his right to work peaceably. But these same officials, all of whom have shouted from the housetops their undying devotion to the welfare of this forgotten man, will move heaven and earth to help A. F. of L. The only protection that is left to the unaffiliated worker or to the employe identified with an employe representation plan is that afforded by responsible employers and by enlightened public opinion.

Is it not time for employers and the public to insist emphatically that federal, state and local politicians stop licking the boots of A. F. of L.? Isn't it time that Senator Wagner and the other tools of Green and Lewis be told in unmistakable terms that their supine service to A. F. of L.—while enhancing the power of its leaders, promoting lawlessness and encouraging communistic uprisings—really is a disservice to the members of A. F. of L. and is rank, oppressive discrimination against the great majority of employes, numbering more than 20,000,000, who have no desire to be affiliated with A. F. of L.!

How long will this great nation permit its servants in government to exploit all employes for the aggrandizement of a handful of arrogant A. F. of L. leaders?

THE BUSINESS TREND



STEEL'S *index of activity in the iron, steel and metalworking industries remains unchanged at* 84.0 *in the week ending March* 23:

Week ending	1935	1934	1933	1932
Feb. 2	81.8	66.9	49.9	56.2
Feb. 9	82.7	70.7	48.7	56.0
Feb. 16	82.8	72.4	48.3	54.4
Feb. 23	80.5	75.5	46.0	55.1
Mar. 2	81.1	78.8	47.4	54.1
Mar. 9	82.0	78.6	43.4	54.8
Mar. 16	84.0†	79.9	42.7	54.4
Mar. 23	84.0*	79.7	44.6	53.5

†Revised. *Preliminary.

The index charted above is based upon freight car loadings, electric power output, automobile assemblies (estimated by Cram's Reports) and the steelworks operating rate (estimated by STEEL). *Average for* 1926 *equals* 100, *weighted as follows: Steel rate* 40, *and car loadings, power output and auto assemblies each* 20.

Business Resists Bearish Influences Stubbornly

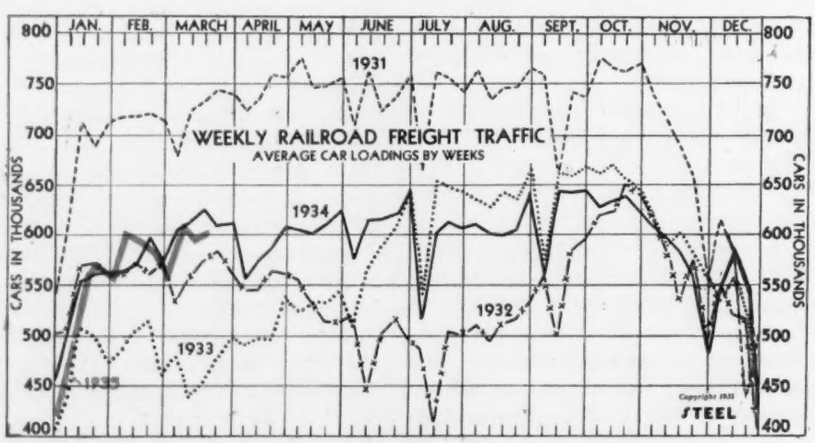
IN SPITE of the jittery state of business sentiment, actual activity in the iron, steel and metalworking industries is clinging determinedly to the highest level recorded since May, 1934. STEEL'S activity index for the week ending March 23 stands at 84, unchanged from the previous week.

The moderate recession in steelworks operations is more than offset by the steady trend of electric power output at high levels, a continued increase in automobile assemblies and slightly heavier freight traffic. The real significance of current reports on car loadings is somewhat obscured by the fact that an unusual heavy movement of coal in anticipation of a strike has stimulated traffic on eastern roads. This is compensated for in part by reduced loadings in western states due to dust storms.

In reporting a definite decrease in unemployment for February, the National Industrial Conference board confirms the earlier scattered reports of improvement. The board estimated the number of unemployed at 9,898,000, a drop of 242,000 from January. Concurrently, the international labor organization, reported from Geneva that the number of unemployed throughout the world is about 25,000,000. That 40 per cent of the jobless army is found in the world's richest nation is a challenge to our vaunted national ability and resourcefulness.

At the threshold of the second quarter, the outlook is somewhat more hopeful than it was at the ides of March. The stubborn resistance of business to political uncertainties has been reassuring. For those who believe in the efficacy of scrap prices as a forecaster of business volume, the stronger tone in the Pittsburgh market is heartening.

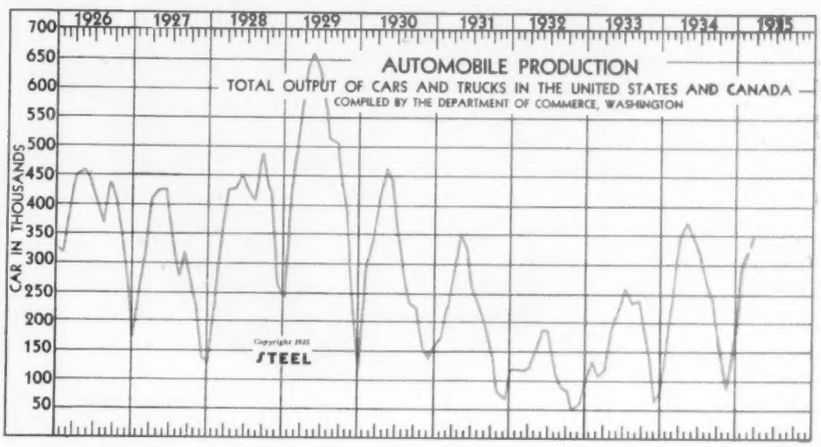
1935	
Mar. 16	597,432
Mar. 9	587,270
Mar. 2	604,642
Feb. 23	552,896
Feb. 16	581,981
Feb. 9	592,560
Feb. 2	598,164
Jan. 26	555,768
Jan. 19	562,955
Jan. 12	553,675
Jan. 5	498,073



1934	
Mar. 17	627,549
Mar. 10	614,120
Mar. 3	605,717
Feb. 24	574,908
Feb. 17	600,268
Feb. 10	573,898
Feb. 3	565,401
Jan. 27	563,100
Jan. 20	561,902
Jan. 13	557,266
Jan. 6	500,813

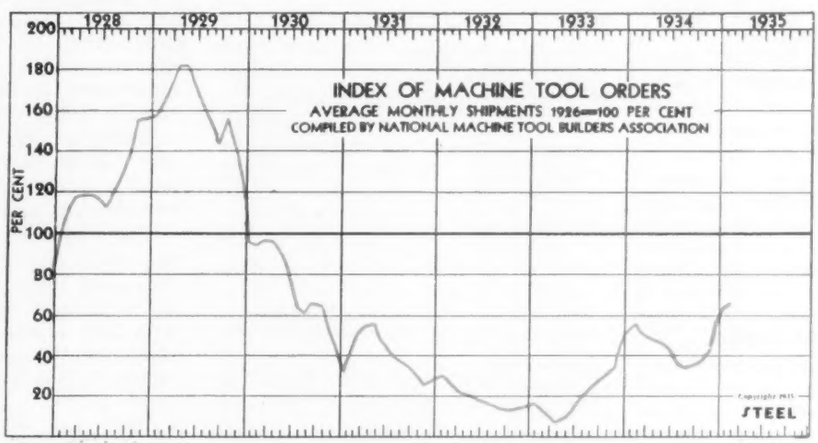
Automobile Output Continues Seasonal Climb

	1935	1934
January	303,372	163,811
February	358,658	240,278
March	.....	345,443
April	.....	373.108
May	.....	351,813
June	.....	321,970
July	.....	277,690
August	.....	244,714
September	.....	174,450
October	.....	136,271
November	.....	80,162
December	.....	185,919



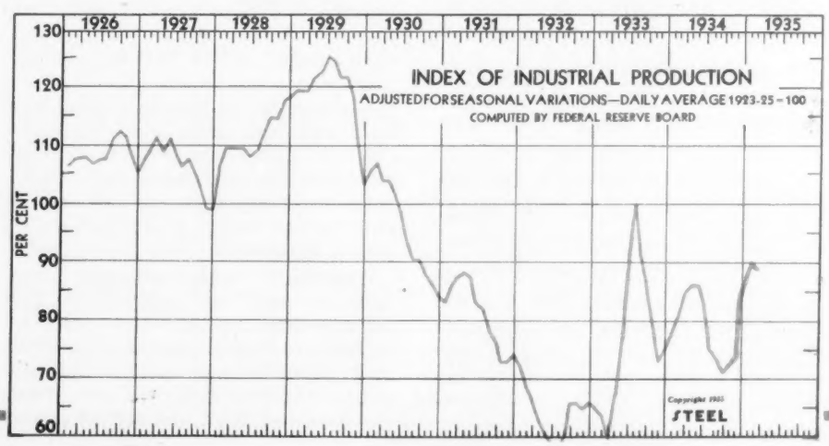
February Machine Tool Index Up Moderately

	1935	1934
Jan.	61.3	56.5
Feb.	61.5	58.2
March	.....	50.9
April	.....	48.5
May	.....	46.8
June	.....	42.6
July	.....	38.6
Aug.	.....	37.1
Sept.	.....	37.4
Oct.	.....	40.5
Nov.	.....	44.2
Dec.	.....	54.1



	1933	1932
Jan.	18.3	32.8
Feb.	15.2	30.4
March	11.1	23.9
April	8.3	20.6
May	10.6	20.8
June	15.5	21.7
July	22.4	18.7
Aug.	27.9	16.8
Sept.	30.9	15.3
Oct.	33.3	15.7
Nov.	38.0	16.4
Dec.	51.0	17.6

Industrial Production Off Slightly in February



	1935	1934	1933
January	91	78	65
February	89	81	64
March	....	85	60
April	....	86	67
May	....	86	77
June	....	83	91
July	....	75	100
August	....	73	91
September	....	71	84
October	....	73	77
November	....	74	73
December	....	86	75

Building

BY F. H. RAMAGE
Assistant Sales Promotion Manager,
Republic Steel Corp.

Trained inspector makes minute inspection of each length of electric weld pipe, and reveals to the sales student how he determines uniformity of wall thickness, concentricity and freedom from scale and surface defects

GONE are the days when all the steel salesman had to do was to knock on the customer's door and inquire, "How many tons today, please?" Today the successful salesman must have a complete background of production, processing, distribution and use of steel and its many alloys. In the accompanying article, Mr. Ramage takes the reader through the sales school built up by Republic Steel Corp., and demonstrates the steps being taken by this producer to insure able, efficient and aggressive field representation. Written specifically at STEEL'S request, this discussion should prove intensely interesting to alert merchandisers, as well as to buyers.

THE horizon of steel merchandising is assuming a new contour. Changing conditions, of which there are many, have altered the steel selling picture to a marked degree.

We are living in an era that commands a new perspective. Methods completely successful several years ago now are losing momentum and gathering cobwebs.

For years, steel producers were faced with the task of manufacturing enough steel to meet demands of customers. Production was the major offensive. Mill capacities were increased in an endeavor to meet the demand. No one spared the horses to reach that goal.

Overcapacity for Market

Because flat-rolled steel is consumed in a multitude of fabricated steel products, a record of this division of the steel industry expansion commands review. In 1929 the rated capacity was 11,378,000 net tons with sales, the largest in history, of 9,349,000 net tons, leaving an excess capacity of 2,029,000 net tons. The 1934 estimated capacity was 13,069,000 net tons, with estimated sales of 5,806,000 net tons. If over night we could sell the 1929 production, there would still be an excess of 3,720,000 net tons capacity. The increase in capacity for 1934 was accounted for basically by construction of six continuous strip-sheet mills. Figures for 1935 will surpass those of 1934, since three more continuous mills will be added to existing capacity. (Figures by National Association of Flat Rolled Steel Manufacturers)

Now we awaken to the realization present markets can no longer absorb these vast capacities; neither can manufacturers consume such steel tonnages to the same specifications in accordance with past practices; nor can they fabricate products to the same standards or styles.

To bolster lagging sales and develop new uses, manufacturers are overhauling products. They are effecting greater utility, longer life, increased efficiency, greater strength and more attractive appearance.

To meet this new stride, metals are destined to play an ever increasing part. Many new and improved steels and alloys have been developed to meet these needs. Too, the steel industry is faced with the creation and development of new markets. This means new uses, applications and a greater per capita consumption of steel.

This suggests the question: "What are steel companies going to do about it?" Obviously, future merchandising of steel will be conducted on a more intelligent and comprehensive basis. Today the pendulum is swinging far over to the selling side. It is only natural, since for many years production problems have been of major importance.

The day of backlog tonnage customers has practically vanished. The steel buyer of today would not be recognized by a steel salesman who had taken a Rip van Winkle sleep for the past four years. His buying habits have been altered to a large degree. He is faced with an entirely new set of conditions. He needs help and plenty of it.

Rise of Sales Engineer

Because of this, the steel buyer demands solicitation by experts or specialists. He also insists upon the widely experienced or generalized salesmen with whom he can counsel on his many varied requirements.

Specialization as compared to generalization in the selling of steel has long been and still is a debatable subject. Large corparations such as Republic are completely integrated, manufacturing both special alloys and regular grades of steel in many forms, serving all types of industry.

Frequently many different problems or conditions are met in the same general fields. Each one may require special study to determine the type of steel to meet the specific need. On this list will be items standardized, tried and proved in the

a Sales Force for 1940

classification of carbon steels. Next, possibly a corrosion resistant, a heat resistant, a fatigue resistant, a machining, a forging, a deep drawing, a welding product will be in demand. Generally a combination of these features is present. It may represent a new problem for the industry. Although not new for the field, it may require specialized treatment for this customer.

The buyer does not expect a steel salesman to be a walking metallurgical laboratory; neither has he any time to spend in gossip with the back-slapping variety of salesman. He wants a salesman who knows his products. He wants a salesman who can offer tangible suggestions on the proper use of steel and how savings can be effected by its use. He wants to bolster up his lagging sales; he wants to know how to improve his existing products or create new styles, or designs. New steels and special alloys can help do the job. It is a real opportunity for service.

Planning for the Future

Alert to the changing times, Republic started several years ago to lay plans for its future sales program. An active sales school has functioned without interruption during the depression. Its members largely will constitute the foundation of the future selling organization. It is planned selling through education. The sales student is likened to the young interne; he is taught how to diagnose problems of steel users.

The school is misnamed to a certain extent; that is, the center of training is on practical work and observation. The academic endeavors are limited to the so-called classroom lecture and oral meetings. These meetings are also open forums for questions. Outside study is encouraged; in fact, it is a necessity for all, even for students with technical training.

The sales school is under direct management of the advertising and sales promotion division. This division spends a large portion of its time in the field with the sales force. It also supervises activities of sales promotion men (sales engineers) located in all major district offices. Hence it has full realization of the problems encountered with various types of customers; and it has a complete analysis of the job to be done. Experience helps the division to catalog mistakes.

From field contact and also from direct co-operation with mill superintendents and foremen, it is possible to keep the training program up to date. Advice and assistance of operating department personnel also are vital parts of the school's success.

Republic feels a deep sense of responsibility in the part it plays in the molding of a young sales school applicant's future. As a rule he comes to the work fresh from college. He has never held a job except for vacation periods. He believes that he would make a salesman but lacks experience to prove it. He is, however, free from the traditions of the steel industry and consequently represents excellent training material.

The author, F. H. Ramage, attended Ohio State university, Columbus, O., in 1920. *He graduated from Michigan College of Mining and Technology, Houghton, Mich., in* 1924. *After two years with the Marion Steam Shovel Co., Marion, O., he joined the Republic Iron & Steel Co. as sheet mill metallurgist. In* 1927 *he was assigned to the New York district sales office as sales engineer, and in* 1929 *was transferred to Youngstown general office sales on special development of Toncan iron pipe. He was named assistant sales promotion manager, covering all products, in* 1931.

All permanent structures must be built on a solid foundation. The sales school is no exception to this rule. It is resting on and anchored to bed rock, comprising properly selected applicants. The selection has a definite relation not only to success of the training period but also to ultimate progress of the student in actual selling work.

Many still say that salesmen are born and not made. Natural born salesmen are surely few and far between. Even so, a perfect gift of appearance and personality may be backed up by an empty head; others lacking in physical attributes many times excel in mental attainments.

Face Five Interviewers

All applicants to the Republic school get their first taste of salesmanship by finding it necessary to sell themselves to five different individuals. This selection period is more stringent than that exercised by most companies because the future work of the applicant is to be confined to sales only. Some organizations need not use such discretion since they allocate students to various company departments such as engineering, metallurgy, mining or operations. Extreme care is used in selection. During the entire course the student is on probation. Wholesale weeding out, however, is found to be unnecessary.

A copy of the application blank is reproduced on page 27. It does not vary greatly from the orthodox employment blank. It serves as a master record of the student during his entire period. The execution of this form reveals a number of points for study:

1. Neatness (typed, pen or pencil)
2. Completeness (photograph and detail)
3. Education (type, rating, support)
4. Vacations (how spent)
5. Activity in school affairs

The personal interview affords an opportunity to gage the applicant's personality, earnestness and aggressiveness. Since five different individuals interview applicants, a composite opinion can be handed down; hence, intelligence tests are not used,

but a careful personal study under varying circumstances and at different intervals results in a final selection of the proper applicant.

The training period is divided into two major parts: (1) clerical apprentice and (2) mill training.

To see the steel business on paper first of all is fundamental. The student is assigned for a period of not less than six months to the general office sales. He spends from one to three months in each of six sales divisions. Here he has a regular job, perhaps keeping records, or acting as would a hall boy, delivering messages when requested. He is under observation by the entire department. This affords an ideal testing ground since here it is possible to gage his initiative, accuracy, faithfulness, alertness, interest, adaptability, judgment and above all, his personality.

Divisions Report on Students

Each sales division issues a complete report on the performance of the student. After alloted time has been spent in several divisions some idea is gained as to fitness of the student for sales work. If reports are not favorable, the student either is assigned to some other line of work in the organization or is released.

During the clerical apprenticeship the student has passed several important mileposts: A preliminary knowledge of office procedure is gained, customer names and types of products became familiar, uniform extras are studied, pricing and ordering are taught. All this results in a better understanding of operations when the student goes into the mill. He has occupied a regular job and has learned to fulfill its obligations. This procedure has permitted the company to double check its original selections and more accurately to measure the ability of the student.

The student is now ready to enter the scheduled mill training course, lasting for a period of 57 weeks. As mentioned previously, this training period is one of observation, classroom lectures, oral quizzes and written reports. As an example, the following is the routing of the student for the coke and by-product plant covering a period of two weeks. The time spent in succeeding departments will vary according to problems presented.

Mill Course

First day:

1. Talk by sales department officials.
2. General instructions.
3. Registration through employment bureau.
4. Time clock cards entered.
5. Safety department instructions.
6. Introduction to operating department, district manager and personnel.

Coke Plant and By-products

Two weeks:

1. Assigned to and under direct supervision of superintendent.
2. Study and discussion of department. Outline of operations (written detail given student).
3. List of department personnel, with details of duties.
4. Each day spent in plant in contact with all foremen.
5. Review each morning on previous day's work with superintendent or assistants.
6. Typewritten detailed report on department required.
7. Superintendent reads and grades reports and rates student's conduct and ability on separate blank (see accompanying report blank on page 27).

In order to present the immense amount of work that the student must cover in 57 weeks, a condensed mill course outline follows:

Youngstown and Warren, O., Districts

(a) Coke plant and by-products.
(b) Blast furnace.
(c) Open hearth.
(d) Blooming mill (soaking pits).
(e) Continuous bar and billet mills.
(f) Plate mill.
(g) Continuous bar (special sections).
(h) Butt weld pipe mills.
(i) Lap weld pipe mills.
(j) Electric weld pipe mills.
(k) Hot strip mills.
(l) Cold strip mills.
(m) Tin mills (tin mill black, lacquered plate).
(n) Sheet mills.
(o) Electrical sheets and strip.
(p) Bessemer converter.
(q) Blooming, bar, skelp, spikes, etc.
(r) Laboratory.
(s) Upson Nut division, Cleveland.

Canton and Massillon, O., Districts

(a) Coke plant.
(b) Blast furnace.
(c) Open hearth (carbon and alloy steels).
(d) Electric furnaces.
(d) Chipping and heat treating.
(f) Continuous bar and billet mills (alloy and carbon steel).
(g) Hot strip (Enduro stainless steel).
(h) Cold strip (Enduro stainless steel).
(i) Sheet mills (carbon, Enduro stainless steel, Toncan iron, galvannealed, high-tensile steels, enameling iron, autobody and high finish sheets).
(j) Special products—polishing Enduro stainless steel.
(k) Laboratory.

Buffalo and Chicago plants are not shown since special time is allotted according to the particular circumstances.

Each subsidiary is included in the schedule such as:

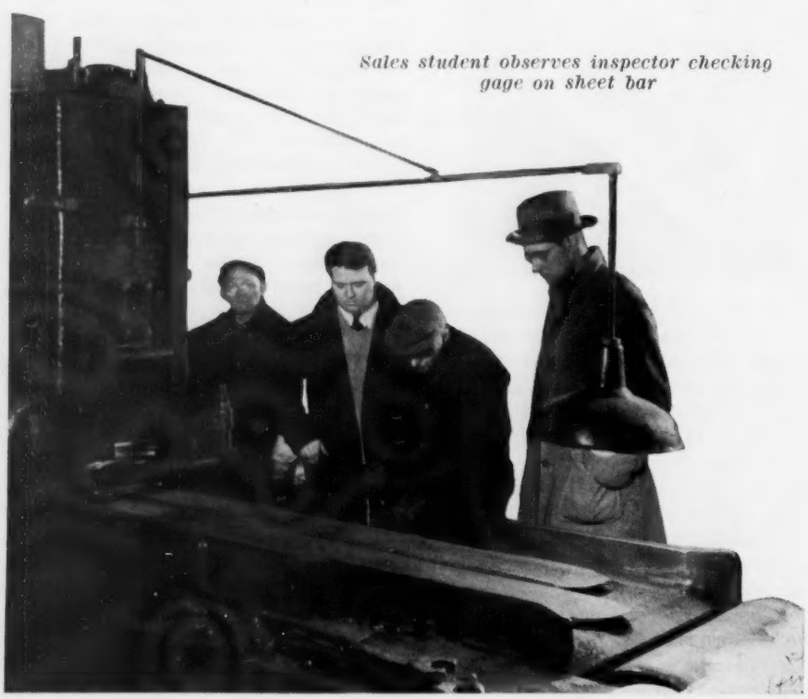
Steel & Tubes Inc.—Boiler tubes, conduit, mechanical tubing.

Union Drawn Steel Co.—Cold drawn products.

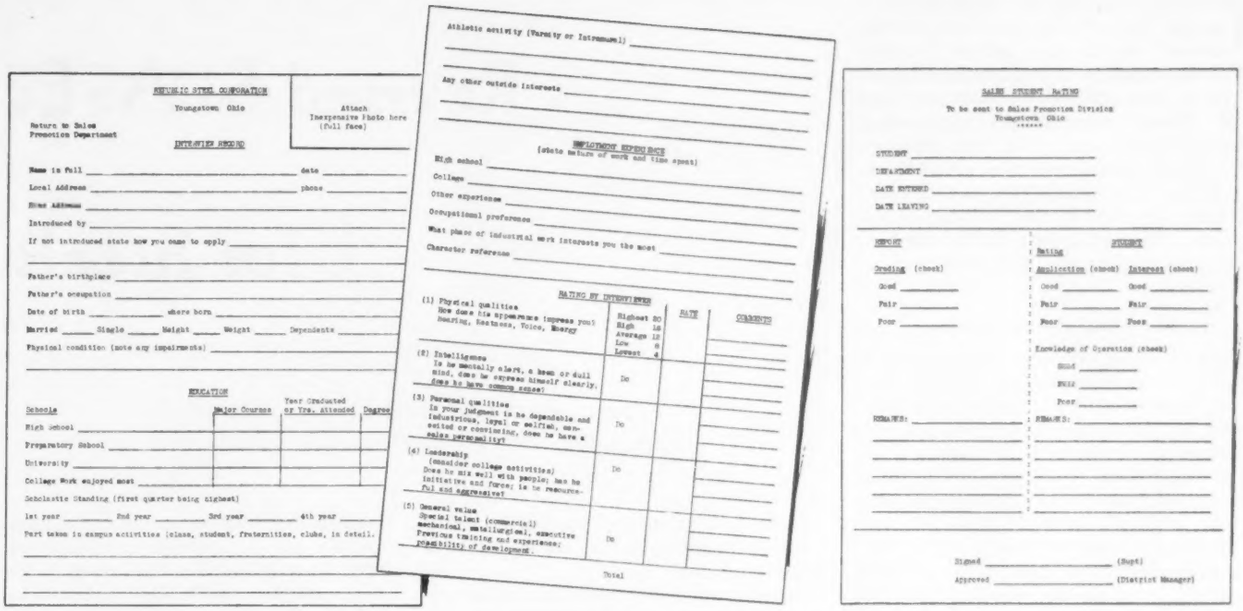
Berger Mfg. Co.—Fabricated products.

Each mill is studied from beginning to end, including operation of mills, finishing, normalizing, annealing, heat treating, cold rolling, polishing, inspection and shipping. Special attention is given to the inspection departments of each mill. The student actually inspects steel in many departments, as shown in accompanying illustrations.

During the mill periods, students are addressed by superintendents of departments. Talks will cover points such as history, detailed and fairly technical discussion of process, relation to other departments, relation



Sales student observes inspector checking gage on sheet bar



Two blanks at the left are obverse and reverse of application form filled out by student before he is admitted to the sales school. Blank at the right is a superintendent's report on the student's aptitude in his department

to quality of resultant product and the like.

Similarly, the sales manager or assistant of the division concerned addresses the students, about the sales problems of his particular department. A question hour follows each talk. Many lively discussions are encountered. This serves as a good check on the development of each student. All benefit by a common discussion of the topic.

This lecture course program consists of regularly scheduled meetings with various sales and operating department managers and assistants acting as the principal speakers, as follows:

Sales Meetings

1. Vice president in charge of sales.
2. General manager of sales.
3. Assistant general manager of sales.
4. Bar sales division.
5. Pig iron by-products division.
6. Pipe sales division.
7. Sheet and strip steel division; Toncan sheets.
8. Tin plate sales division.
9. Toncan metallurgical engineer.
10. Alloy sales division: While in this division the student attends weekly and special meetings on both sales and operating problems. The meetings include basic comparison and study of carbon and alloy open-hearth steel practice, also complete development of the electric furnace and the manufacture of Enduro stainless steel.

Operating Meetings

1. Coke plant and by-products
2. Blast furnace.
3. Open hearth.
4. Blooming and bar mills.
5. Strip (hot and cold).
6. Sheet mills.
7. Pipe (butt and lap weld).
8. Pipe (electric weld).
9. Bessemer plant.
10. Claim department.
11. Tin plate.
12. Safety department.
13. Chief metallurgist.

The meeting programs are expanded in many instances, with superintendents, foremen, inspectors, metallurgists and mill operators in attendance.

Graded Reports Give Check

Each day the student assembles notes. When his alloted time in a given department has passed, a final summarized report is submitted for approval. First the operating department superintendent corrects the reports in detail. His gradings are confidential and of great value. An example of this report is reproduced above, to the right.

Another type of meeting in addition to those mentioned is the oral quiz period held monthly under sales supervision. Impromptu answers provide a valuable check on the progress of the student.

A sales clinic is a new development of the course. Two days prior to the clinic each student receives a letter informing him that he is requested to call on a certain customer. Fictitious names and conditions are used. The conference is held in one of the sales offices. While each student takes the role of a salesman, the others learn by acting as a silent audience. A sales department official assumes the title of purchasing agent. Results have been gratifying. It presents an excellent opportunity to gage the student in an entirely new atmosphere. No less than two of these meetings convene in the 57-week period.

The director of purchases also addresses the group. It has been educational and helpful for students to receive the advice of one who is on the purchasing side of the fence. Actual time in the purchasing department is also under consideration. Such observation undoubtedly would be enlightening to students.

Outside steel fabricators have provided speakers during each year. Here the student learns of many experiences that assist in his training. Trips to various fabricator-customer plants are arranged, when the students are assigned to the Warren, O., mills.

Periodic checks are made during the course, to eliminate any student deemed unfitted for the work. Upon completion of the mill course, student records are assembled and tabulated. Finally the student is assigned to the general office, pricing division. Two or more months are spent in learning various pricing methods. During this time the student is in contact with various sales divisions where he has received his sales clerical apprenticeship. Now his time is directed to matters strictly commercial and naturally better understood due to his mill training.

In the meantime, sales officials have been informed of the progress of each student. Allocation to a sales territory then is given detailed study. The student fully realizes his obli-

(*Please turn to Page* 60)

Revised S. A. E. for Steels

BY F. P. GILLIGAN

Chairman, Iron and Steel Division, Standards Committee, Society of Automotive Engineers

IT IS now nearly 30 years since a group of automobile engineers, known as the Mechanical Branch of the Association of Licensed Automobile Manufacturers, engaged the late Henry Souther as consulting metallurgist and called into conference several steel mill representatives to discuss the need for chemical specifications for a limited group of steels that would be suitable for the construction of the various automobile parts.

Need For Specifications

At that time the commercial structural steels were chiefly of the carbon type and were quite generally sold on the basis of physical properties in the condition as delivered to the purchaser. Alloy steels were merchandised under trade names and each producer used an analysis that differed slightly but significantly from his competitor's. The art of heat treatment as applied outside the toolroom or blacksmith shop was in its infancy, and amidst the known and unknown variations in the steels used and the frequent absence of pyrometers on furnaces difficult to control, the engineer and the production departments were almost continually in hot water—which may explain why so many shop executives were considered "hard boiled" in those days. Consequently, when the automobile engineer of that day desired to change his source of supply he had reason to hesitate lest his last state be worse than his first.

Steel companies, having considerable ordnance and tool steel experience, recognized the problem that confronted the automobile engineer and willingly co-operated in the development of a group of chemical specifications for both carbon and alloy steels which enabled the engineer to exercise some choice in the type of steel used and in the range of physical properties produced by suitable heat treatment. They also assisted in the preparation of recommended methods for heat treating the steels.

That group eventually developed into the S.A.E. Iron and Steel Division, and its first report under that title was published in 1911. It covered 18 steels, 7 carbon and 11 alloy steels. In 1912 the S.A.E. numbering system for steel was adopted, and in 1915 the first physical property charts for S.A.E. steels were published.

It is very doubtful if even the most ardent enthusiast in the group that initiated this standardization work on steels ever dreamed the day would come when, to satisfy the demands of the users of these specifications, over one hundred chemical compositions would be known as S.A.E. steels, or that the users would extend to practically every field of steel consumption where heat treatment is an essential part of the production process. The same art of heat treatment that brought these steel specifications into existence has promoted their general use and made them a part of the daily language of every metallurgist and steel treater. As a result of this popularity, of their general appro-

THE accompanying discussion of the new "S.A.E. Iron and Steel Specifications" is prepared from an article appearing in the April issue of the S.A.E. Journal published by the Society of Automotive Engineers, 29 West Thirty-ninth street, New York. The author, F. P. Gilligan, is secretary-treasurer, Henry Souther Engineering Corp., Hartford, Conn. The 11 tables giving chemical compositions of S.A.E. steels and the explanation of the steel numbering system are reproduced from the new specifications which the society has just issued in the form of a 100-page booklet reprinted from the 1935 Handbook.

Carbon Steels

S. A. E. No.	Carbon Range	Manganese Range	Phosphorus Max.	Sulfur Max.
1010	0.05–0.15	0.30–0.60	0.045	0.055
1015	0.10–0.20	0.30–0.60	0.045	0.055
X1015	0.10–0.20	0.70–1.00	0.045	0.055
1020	0.15–0.25	0.30–0.60	0.045	0.055
X1020	0.15–0.25	0.70–1.00	0.045	0.055
1025	0.20–0.30	0.30–0.60	0.045	0.055
X1025	0.20–0.30	0.70–1.00	0.045	0.055
1030	0.25–0.35	0.60–0.90	0.045	0.055
1035	0.30–0.40	0.60–0.90	0.045	0.055
1040	0.35–0.45	0.60–0.90	0.045	0.055
X1040	0.35–0.45	0.40–0.70	0.045	0.055
1045	0.40–0.50	0.60–0.90	0.045	0.055
X1045	0.40–0.50	0.40–0.70	0.045	0.055
1050	0.45–0.55	0.60–0.90	0.045	0.055
X1050	0.45–0.55	0.40–0.70	0.045	0.055
1055	0.50–0.60	0.60–0.90	0.040	0.055
X1055	0.50–0.60	0.90–1.20	0.040	0.055
1060	0.55–0.70	0.60–0.90	0.040	0.055
1065	0.60–0.75	0.60–0.90	0.040	0.055
X1065	0.60–0.75	0.90–1.20	0.040	0.055
1070	0.65–0.80	0.60–0.90	0.040	0.055
1075	0.70–0.85	0.60–0.90	0.040	0.055
1080	0.75–0.90	0.60–0.90	0.040	0.055
1085	0.80–0.95	0.60–0.90	0.040	0.055
1090	0.85–1.00	0.60–0.90	0.040	0.055
1095	0.90–1.05	0.25–0.50	0.040	0.055

Specifications Announced

priateness for all types of construction, and convenience of identification they enjoy both national and international recognition.

The last previous extensive revision was made in 1922. Since that time research by both steel user and steel maker has brought forth new steels, as well as modifications in and refinements of many of the long established compositions. A series of heat and corrosion-resisting alloys has been added. Advantage has been taken of the results of extensive research in the melting and finishing operations of steelmaking and a system of grain size control adopted for the purchase of various types of S.A.E. steels. The grain size chart adopted as standard by the S.A.E. was developed by the American Society of Testing Materials, in which work individual members of the S.A.E. Iron and Steel division, representing users and consumers, participated.

Another new feature is the inclusion of a group of specifications for automotive gray iron castings. These specifications pertain to strictly automotive products, and are intended to supplement, not displace, existing gray iron specifications as developed by the American Society for Testing Materials and the American Foundrymen's association. (The new specifications will be presented in an early issue of STEEL.)

By reason of the increasing use of heat treated steel castings, carbon and alloy, of which many types practically duplicate the compositions of S.A.E. wrought steels, the Iron and Steel division adopted as S.A.E. standard the latest approved specifications of the American Society for Testing Materials, as that society has thoroughly covered this field and its specifications for steel castings are entirely acceptable in every respect for both automotive and general users.

Duplication Is Avoided

Likewise, the Iron and Steel division has adopted as an S.A.E. standard specification A-47-33 of the American Society for Testing Materials for malleable iron castings, in the development of which automotive interests participated.

This procedure is in conformity with the practice of the division to avoid entering fields of metallurgical standardization that are being efficiently handled by other groups, but to co-operate with such groups in the adoption of common specifications where practicable.

When the Iron and Steel division began this revision in April, 1934, it had to give careful consideration

PERSONNEL of the Iron and Steel division, S.A.E. Standards committee, under whose direction the new iron steel specifications were prepared and issued, is as follows:

F. P. Gilligan, Henry Souther Engineering Corp., chairman
E. F. Davis, Warner Gear Co., vice chairman
J. R. Adams, Midvale Co.
A. L. Boegehold, General Motors Corp.
H. Bornstein, Deere & Co.
H. T. Chandler, Vanadium Corp. of America
Bishop Clements, Wright Aeronautical Corp.
A. T. Colwell, Thompson Products Inc.
A. H. d'Arcambal, Pratt & Whitney Co.
William Davis, Pittsburgh Crucible Steel Co.
B. H. DeLong, Carpenter Steel Co.
N. L. Deuble, Republic Steel Corp.
H. J. Fischbeck, Pratt & Whitney Aircraft Co.
H. W. Graham, Jones & Laughlin Steel Corp.
W. J. Harris, Studebaker Corp.
W. G. Hildorf, Timken Steel & Tube Co
A. J. Herzig, Climax Molybdenum Co.
E. J. Janitzky, Illinois Steel Co.
J. B. Johnson, War Department, Air Corps
G. E. Knable, Carnegie Steel Co.
H. B. Knowlton, International Harvester Co.
F. E. McCleary, Dodge Bros.
O. W. McMullan, Timken Detroit Axle Co.
J. G. Morrow, Steel Co. of Canada
R. B. Schenck, Buick Motor Co.
E. W. Upham, Chrysler Corp.
J. M. Watson, Hupp Motor Car Corp.
T. H. Wickenden, International Nickel Co.
Henry Wysor, Bethlehem Steel Co.

Free-Cutting Steels

S. A. E. No.	Carbon Range	Manganese Range	Phosphorus Range	Sulfur Range
1112	0.08–0.16	0.60–0.90	0.09–0.13	0.10 –0.20
X1112	0.08–0.16	0.60–0.90	0.09–0.13	0.20 –0.30
1115	0.10–0.20	0.70–1.00	0.045 max.	0.075–0.15
1120	0.15–0.25	0.60–0.90	0.045 max.	0.075–0.15
X1314	0.10–0.20	1.00–1.30	0.045 max.	0.075–0.15
X1315	0.10–0.20	1.30–1.60	0.045 max.	0.075–0.15
X1330	0.25–0.35	1.35–1.65	0.045 max.	0.075–0.15
X1335	0.30–0.40	1.35–1.65	0.045 max.	0.075–0.15
X1340	0.35–0.45	1.35–1.65	0.045 max.	0.075–0.15

Manganese Steels*

S. A. E. No.	Carbon Range	Manganese Range	Phosphorus, Max.	Sulfur, Max.
T1330	0.25–0.35	1.60–1.90	0.040	0.050
T1335	0.30–0.40	1.60–1.90	0.040	0.050
T1340	0.35–0.45	1.60–1.90	0.040	0.050
T1345	0.40–0.50	1.60–1.90	0.040	0.050
T1350	0.45–0.55	1.60–1.90	0.040	0.050

*Silicon range of all S. A. E. basic open-hearth alloy steels shall be 0.15-0.30. For electric and acid open-hearth alloy steels, the silicon content shall be 0.15 minimum.

to the new conditions established by the adoption of the steel code and it therefore arranged for the attendance of a considerable number of representative steel users who were not directly represented on the Iron and Steel division. Both steel users and steelmakers were invited to express themselves freely upon all questions pertaining to S.A.E. steel compositions and their relation to steel code practice. Out of such general discussion was developed a plan of action consistent with the long established policy of the Iron and Steel division—namely, to provide for its membership and the users of its spe-

Nickel Steels*

S. A. E. No.	Carbon Range	Manganese Range	Phosphorus, Max.	Sulfur, Max.	Nickel Range
2015	0.10–0.20	0.30–0.60	0.040	0.050	0.40–0.60
2115	0.10–0.20	0.30–0.60	0.040	0.050	1.25–1.75
2315	0.10–0.20	0.30–0.60	0.040	0.050	3.25–3.75
2320	0.15–0.25	0.30–0.60	0.040	0.050	3.25–3.75
2330	0.25–0.35	0.50–0.80	0.040	0.050	3.25–3.75
2335	0.30–0.40	0.50–0.80	0.040	0.050	3.25–3.75
2340	0.35–0.45	0.60–0.90	0.040	0.050	3.25–3.75
2345	0.40–0.50	0.60–0.90	0.040	0.050	3.25–3.75
2350	0.45–0.55	0.60–0.90	0.040	0.050	3.25–3.75
2515	0.10–0.20	0.30–0.60	0.040	0.050	4.75–5.25

Nickel-Chromium Steels*

S. A. E. No.	Carbon Range	Manganese Range	Phosphorus, Max.	Sulfur, Max.	Nickel Range	Chromium Range
3115	0.10–0.20	0.30–0.60	0.040	0.050	1.00–1.50	0.45–0.75
3120	0.15–0.25	0.30–0.60	0.040	0.050	1.00–1.50	0.45–0.75
3125	0.20–0.30	0.50–0.80	0.040	0.050	1.00–1.50	0.45–0.75
3130	0.25–0.35	0.50–0.80	0.040	0.050	1.00–1.50	0.45–0.75
3135	0.30–0.40	0.50–0.80	0.040	0.050	1.00–1.50	0.45–0.75
3140	0.35–0.45	0.60–0.90	0.040	0.050	1.00–1.50	0.45–0.75
X3140	0.35–0.45	0.60–0.90	0.040	0.050	1.00–1.50	0.60–0.90
3145	0.40–0.50	0.60–0.90	0.040	0.050	1.00–1.50	0.45–0.75
3150	0.45–0.55	0.60–0.90	0.040	0.050	1.00–1.50	0.45–0.75
3215	0.10–0.20	0.30–0.60	0.040	0.050	1.50–2.00	0.90–1.25
3220	0.15–0.25	0.30–0.60	0.040	0.050	1.50–2.00	0.90–1.25
3230	0.25–0.35	0.30–0.60	0.040	0.050	1.50–2.00	0.90–1.25
3240	0.35–0.45	0.30–0.60	0.040	0.050	1.50–2.00	0.90–1.25
3245	0.40–0.50	0.30–0.60	0.040	0.050	1.50–2.00	0.90–1.25
3250	0.45–0.55	0.30–0.60	0.040	0.050	1.50–2.00	0.90–1.25
3312	max. 0.17	0.30–0.60	0.040	0.050	3.25–3.75	1.25–1.75
3325	0.20–0.30	0.30–0.60	0.040	0.050	3.25–3.75	1.25–1.75
3335	0.30–0.40	0.30–0.60	0.040	0.050	3.25–3.75	1.25–1.75
3340	0.35–0.45	0.30–0.60	0.040	0.050	3.25–3.75	1.25–1.75
3415	0.10–0.20	0.30–0.60	0.040	0.050	2.75–3.25	0.60–0.95
3435	0.30–0.40	0.30–0.60	0.040	0.050	2.75–3.25	0.60–0.95
3450	0.45–0.55	0.30–0.60	0.040	0.050	2.75–3.25	0.60–0.95

Molybdenum Steels*

S. A.E. No.	Carbon Range	Manganese Range	Phosphorus, Max.	Sulfur, Max.	Chromium Range	Nickel Range	Molybdenum Range
4130	0.25–0.35	0.50–0.80	0.040	0.050	0.50–0.80	....	0.15–0.25
X4130	0.25–0.35	0.40–0.60	0.040	0.050	0.80–1.10	....	0.15–0.25
4135	0.30–0.40	0.60–0.90	0.040	0.050	0.80–1.10	....	0.15–0.25
4140	0.35–0.45	0.60–0.90	0.040	0.050	0.80–1.10	....	0.15–0.25
4150	0.45–0.55	0.60–0.90	0.040	0.050	0.80–1.10	....	0.15–0.25
4340	0.35–0.45	0.50–0.80	0.040	0.050	0.50–0.80	1.50–2.00	0.30–0.40
4345	0.40–0.50	0.50–0.80	0.040	0.050	0.60–0.90	1.50–2.00	0.15–0.25
4615	0.10–0.20	0.40–0.70	0.040	0.050	....	1.65–2.00	0.20–0.30
4620	0.15–0.25	0.40–0.70	0.040	0.050	....	1.65–2.00	0.20–0.30
4640	0.35–0.45	0.50–0.80	0.040	0.050	....	1.65–2.00	0.20–0.30
4815	0.10–0.20	0.40–0.60	0.040	0.050	....	3.25–3.75	0.20–0.30
4820	0.15–0.25	0.40–0.60	0.040	0.050	....	3.25–3.75	0.20–0.30

*Silicon range of all S.A.E. basic open-hearth alloy steels shall be 0.15-0.30. For electric and acid open-hearth alloy steels, the silicon content shall be 0.15 minimum.

S. A. E. Steel Numbering System

A numeral index system is used to identify the compositions of the S. A. E. steels, which makes it possible to use numerals on shop drawings and blueprints that are partially descriptive of the composition of material covered by such numbers. The first digit indicates the type to which the steel belongs; thus "1—" indicates a carbon steel; "2—" a nickel steel, and "3—" a nickel-chromium steel. In the case of the simple alloy steels the second digit generally indicates the approximate percentage of the predominant alloying element. Usually the last two or three digits indicate the average carbon content in "points," or hundredths of 1 per cent. Thus "2340" indicates a nickel steel approximately 3 per cent nickel (3.25 to 3.75) and 0.40 per cent carbon (0.35 to 0.45); and "71360" indicates a tungsten steel of about 13 per cent tungsten (12 to 15) and 0.60 per cent carbon (0.50 to 0.70).

In some instances, in order to avoid confusion it has been found necessary to depart from this system of identifying the approximate alloy composition of a steel by varying the second and third digits of the number. An instance of such departure is the steel numbers selected for several of the corrosion and heat-resisting alloys.

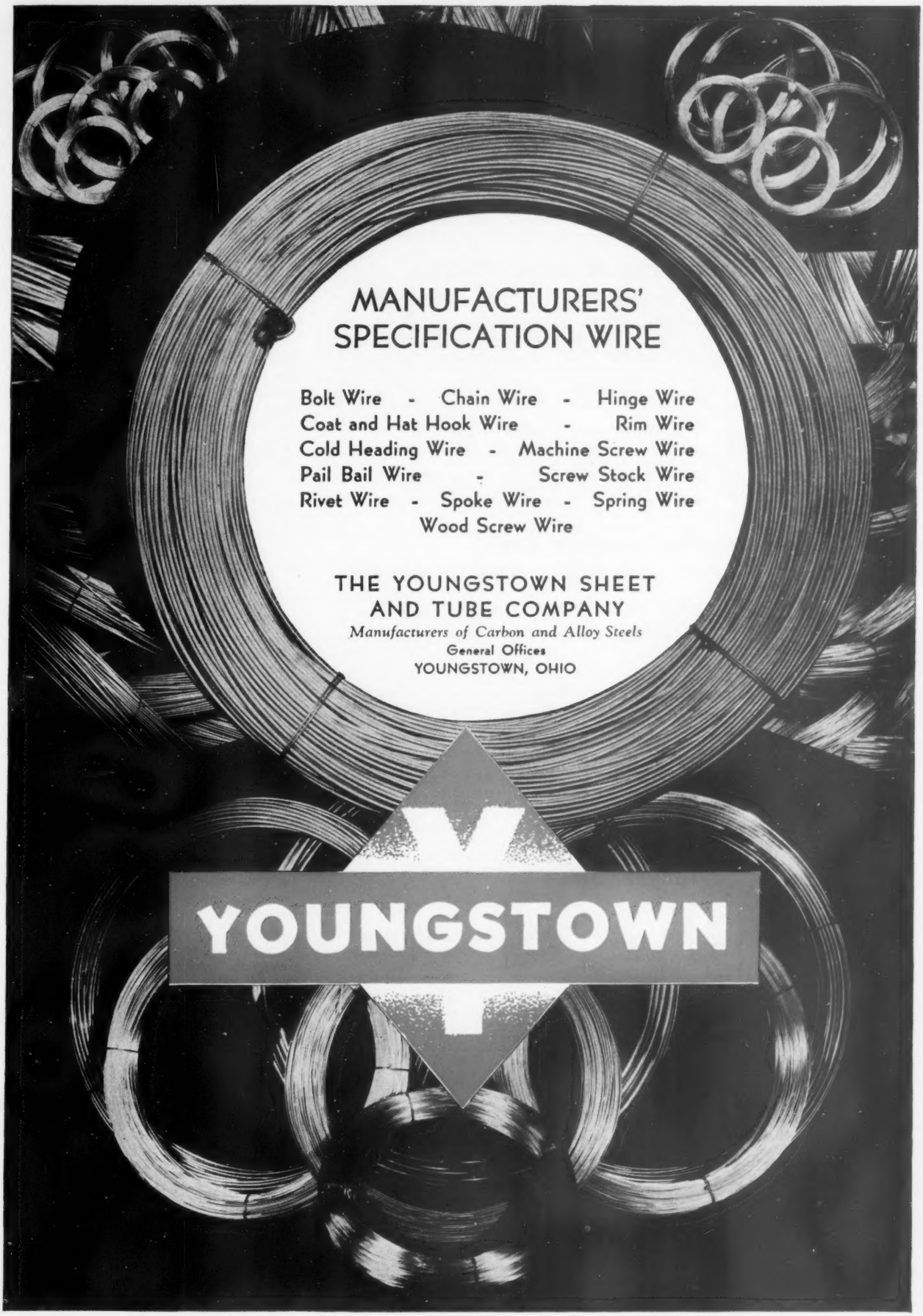
The basic numerals for the various types of S. A. E. steel are:

Type of Steel	Numerals (and Digits)
Carbon steels	1xxx
Plain carbon	10xx
Free cutting (screw stock)	11xx
Free cutting, manganese	X13xx
High manganese	T13xx
Nickel steels	2xxx
0.50 nickel	20xx
1.50 nickel	21xx
3.50 nickel	23xx
5.00 nickel	25xx
Nickel-chromium steels	3xxx
1.25 nickel, 0.60 chromium	31xx
1.75 nickel, 1.00 chromium	32xx
3.50 nickel, 1.50 chromium	33xx
3.00 nickel, 0.80 chromium	34xx
Corrosion and heat-resisting steels	30xxx
Molybdenum steels	4xxx
Chromium	41xx
Chromium-nickel	43xx
Nickel	46xx and 48xx
Chromium steels	5xxx
Low chromium	51xx
Medium chromium	52xxx
Corrosion and heat resisting	51xxx
Chromium-vanadium steels	6xxx
Tungsten steels	7xxx and 7xxxx
Silicon manganese steels	9xxx

Prefixes

The prefix "X" is used in several instances to denote variations in the range of manganese, sulphur or chromium.

The prefix "T" is used with the manganese steels (1300 series) to avoid confusion with steels of somewhat different manganese range that have been identified by the same numerals but without the prefix.


MANUFACTURERS'
SPECIFICATION WIRE
Bolt Wire - Chain Wire - Hinge Wire
Coat and Hat Hook Wire - Rim Wire
Cold Heading Wire - Machine Screw Wire
Pail Bail Wire - Screw Stock Wire
Rivet Wire - Spoke Wire - Spring Wire
Wood Screw Wire
THE YOUNGSTOWN SHEET
AND TUBE COMPANY
Manufacturers of Carbon and Alloy Steels
General Offices
YOUNGSTOWN, OHIO
YOUNGSTOWN

Chromium Steels*

S. A. E. No.	Carbon Range	Manganese Range	Phosphorus, Max.	Sulfur, Max.	Chromium Range
5120	0.15–0.25	0.30–0.60	0.040	0.050	0.60–0.90
5140	0.35–0.45	0.60–0.90	0.040	0.050	0.80–1.10
5150	0.45–0.55	0.60–0.90	0.040	0.050	0.80–1.10
52100	0.95–1.10	0.20–0.50	0.030	0.035	1.20–1.50

Corrosion and Heat-Resisting Alloys

S. A. E. No.	Carbon, Max.	Manganese, Max.	Silicon, Max.	Phosphorus, Max.	Sulfur, Max.	Chromium Range	Nickel Range
30905	0.08	0.20–0.70	0.75	0.030	0.030	17.00–20.00	8.00–10.00
30915	0.09–0.20	0.20–0.70	0.75	0.030	0.030	17.00–20.00	8.00–10.00
51210	0.12	0.60	0.50	0.030	0.030	11.50–13.00	....
X51410	0.12	0.60	0.50	0.030	0.15–0.50	13.00–15.00	....
51335	0.25–0.40	0.60	0.50	0.030	0.030	12.00–14.00	....
51510	0.12	0.60	0.50	0.030	0.030	14.00–16.00	....
51710	0.12	0.60	0.50	0.030	0.030	16.00–18.00	....

Chromium-Vanadium Steels*

S. A. E. No.	Carbon Range	Manganese Range	Phosphorus, Max.	Sulfur, Max.	Chromium Range	Vanadium	
						Min	Desired
6115	0.10–0.20	0.30–0.60	0.040	0.050	0.80–1.10	0.15	0.18
6120	0.15–0.25	0.30–0.60	0.040	0.050	0.80–1.10	0.15	0.18
6125	0.20–0.30	0.60–0.90	0.040	0.050	0.80–1.10	0.15	0.18
6130	0.25–0.35	0.60–0.90	0.040	0.050	0.80–1.10	0.15	0.18
6135	0.30–0.40	0.60–0.90	0.040	0.050	0.80–1.10	0.15	0.18
6140	0.35–0.45	0.60–0.90	0.040	0.050	0.80–1.10	0.15	0.18
6145	0.40–0.50	0.60–0.90	0.040	0.050	0.80–1.10	0.15	0.18
6150	0.45–0.55	0.60–0.90	0.040	0.050	0.80–1.10	0.15	0.18
6195	0.90–1.05	0.20–0.45	0.030	0.035	0.80–1.10	0.15	0.18

Tungsten Steels*

S. A. E. No.	Carbon Range	Manganese, Max.	Phosphorus, Max.	Sulfur, Max.	Chromium Range	Tungsten Range
71360	0.50–0.70	0.30	0.035	0.040	3.00–4.00	12.00–15.00
71660	0.50–0.70	0.30	0.035	0.040	3.00–4.00	15.00–18.00
7260	0.50–0.70	0.30	0.035	0.040	0.50–1.00	1.50– 2.00

Silicon-Maganese Steels

S. A. E. No.	Carbon Range	Manganese Range	Phosphorus, Max.	Sulfur, Max.	Silicon Range
9255	0.50–0.60	0.60–0.90	0.040	0.050	1.80–2.20
9260	0.55–0.65	0.60–0.90	0.040	0.050	1.80–2.20

*Silicon range of all S.A.E. basic open-hearth alloy steels shall be 0.15-0.30. For electric and acid open-hearth alloy steels, the silicon content shall be 0.15 minimum.

cifications steels that were technically adequate and commercially available.

When there appeared to be need for composition limits not then recognized by the steel code, the question was referred to the steel company representatives on the Iron and Steel division who were participating in the development of the steel code for further consideration by the code authorities. In this way a harmonious plan of mutual consideration and reconsideration developed, and it is believed the specification limits ultimately standardized provide grades of steels which are technically adequate for the great majority of users and which are commercially available.. It is recognized that in a limited number of applications closer limitation of certain elements might be necessary to meet the specialized practices of some users, but the Iron and Steel division considers it unwise to adopt limits that would penalize all users in order to satisfy the special requirements of a few.

The significance of the changes made may be summarized briefly. These specifications now cover the carbon range from 0.05 minimum to 1.05 maximum in the carbon series, with sufficient variation in the manganese and sulphur contents to meet the needs of nearly every type of steel user. (See the accompanying table "Carbon Steels"). The compositions standardized conform to the steel code requirements for each type, hence there is no necessity for any user to pay a special price because of non-standard limits.

Wider Choice of Alloy Steels

In the alloy series a greatly increased and diversified list of compositions is provided, including heat-resisting and corrosion-resisting alloys. (See the accompanying tables). For every application the user has a wide choice as to type of alloy steel, range of physical properties, and material cost. No steelmaker or alloy producer is subjected to discrimination. The engineer or designer has only to determine his service stress and other essential requirements, make his selection of acceptable steels, and leave the rest to the purchasing and metallurgical departments. This is in marked contrast with the early days of the automobile industry, when the engineer had to use a different composition every time he changed his source of supply.

The engineer or metallurgist who desires to select his steel upon the basis of physical values may begin with a plain carbon steel with a tensile strength around 45,000 pounds per square inch and gradually ascend the scale of strengths to the highest values, to 250,000 pounds per square

(*Please turn to Page* 53)

CALCIUM-SILICON for Clean Steel

CALCIUM-SILICON is usually added to the ladle as a final deoxidizing agent. It is effective in removing oxides without leaving inclusions in the steel. The reaction products formed are of low specific gravity and rise rapidly in the metal. Sufficient time elapses before pouring for most of these to escape to the surface.

Calcium-Silicon increases the temperature and fluidity of the metal. This is of particular advantage in shanking practice.

Since 1906, Electromet has pioneered in the manufacture of ferro-alloys and metals. Electromet products are outstanding for their uniform analysis, cleanliness, correct sizing and fine grading. Electromet Metallurgists will gladly show you how to use these ferro-alloys under the proper conditions. Write for complete information.

PRODUCTS OF A UNIT OF UCC UNION CARBIDE AND CARBON CORPORATION

CHROMIUM
High-Carbon Ferrochrome (maximum 6% carbon)
Low-Carbon Ferrochrome (in grades, maximum 0.06% to maximum 2.00% carbon)
Chromium Metal
Chromium-Copper
Miscellaneous Chromium Alloys

SILICON
Ferrosilicon 15% Ferrosilicon 50%
Ferrosilicon 75%
Ferrosilicon 80 to 85%
Ferrosilicon 90 to 95%
Refined Silicon (minimum 97% Silicon)
Calcium-Silicon
Calcium-Aluminum-Silicon
Calcium-Manganese-Silicon
Silicon-Copper
Miscellaneous Silicon Alloys

BRIQUETS
(Patented)
Chrome Briquets Silicon Briquets
Manganese Briquets

TUNGSTEN

MANGANESE
Standard Ferromanganese 78 to 82%
Low-Carbon Ferromanganese
Medium-Carbon Ferromanganese
Spiegeleisen
Manganese Metal
Manganese-Copper
Miscellaneous Manganese Alloys

SILICO-MANGANESE
All grades including Silico-Spiegel

VANADIUM
All Grades

ZIRCONIUM
35 to 40% Zirconium
12 to 15% Zirconium
Aluminum-Zirconium
Zirconium-Manganese-Silicon

ELECTRO METALLURGICAL COMPANY
Unit of Union Carbide and Carbon Corporation

UCC

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CARBIDE and CARBON BUILDING
30 EAST 42nd STREET, NEW YORK, N. Y.

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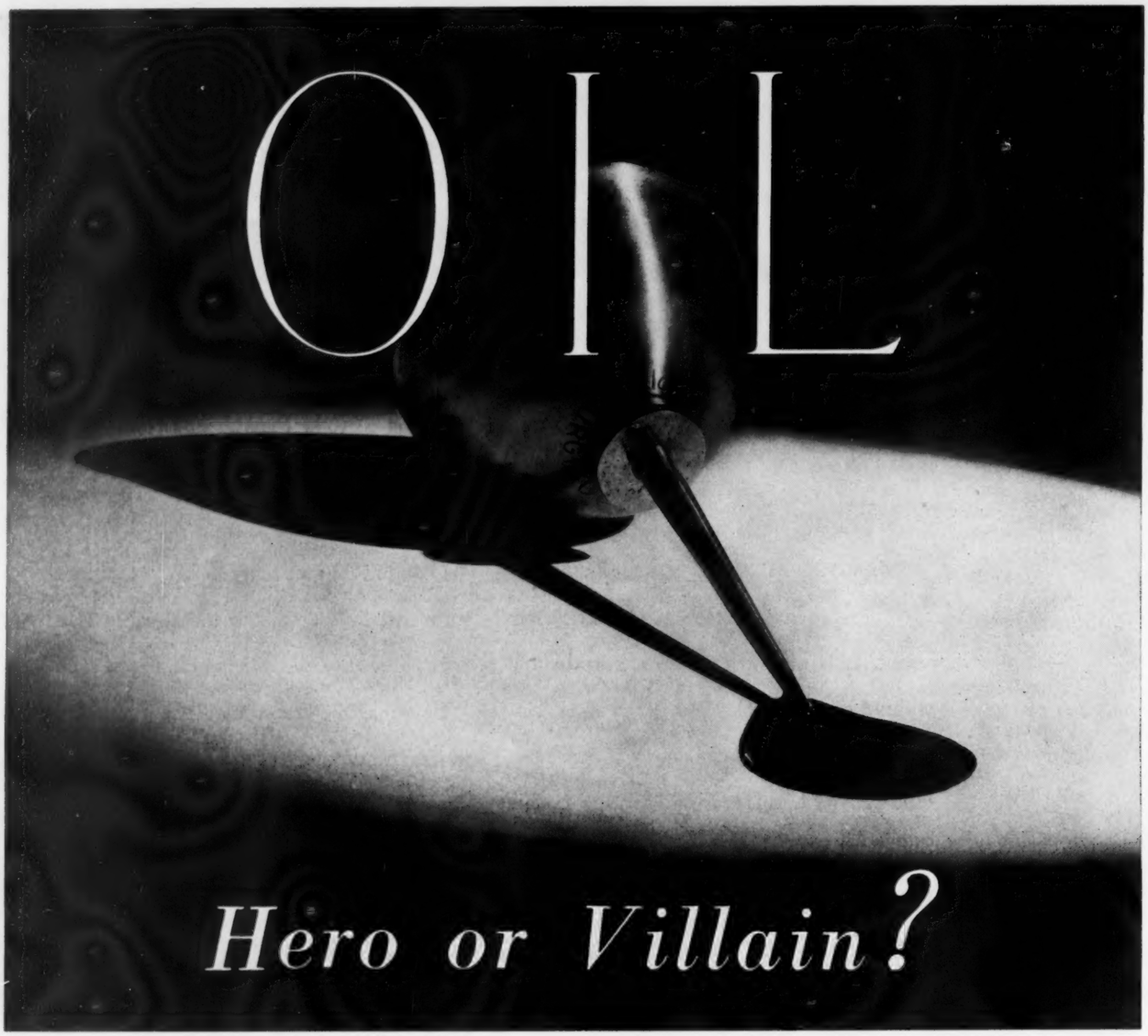


Oil is ruinous to many products . . . yet machines cannot run without it.

Oil is, therefore, an influence for good or evil . . . depending upon whether it is kept in its proper place.

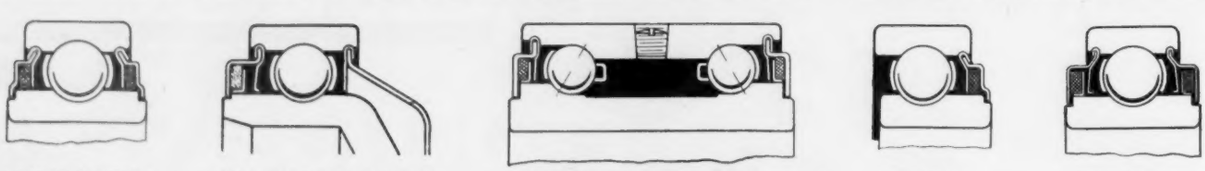
Your most effective and economical solution to this problem is the New Departure N-D-Seal Ball Bearing.

Seals *integral* with the bearing not only retain lubricant, but effectively exclude foreign matter from the highly polished balls and raceways. Machine builders using N-D-Seals no longer need provide separate bearing closures of any kind.

The New Departure Manufacturing Company, Bristol, Conn.

ILLUSTRATED are several variations of the N-D-Seal . . . namely: Double Seal, **lubricated for life;** Conveyor Roll Bearing; Mine Car Wheel Bearing, and Single Seal type. Ask for interesting booklet discussing Seal bearings.

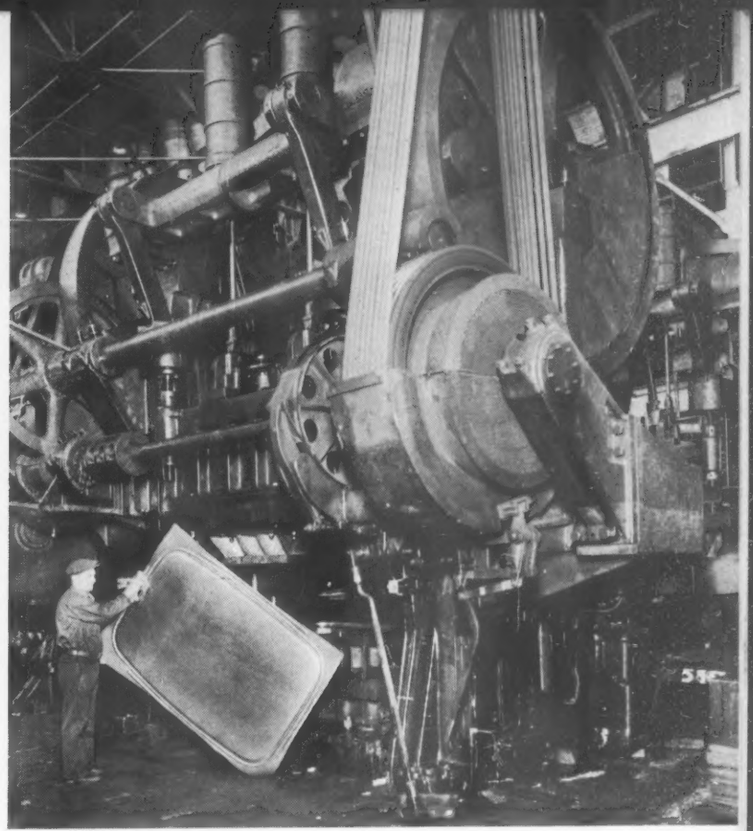
NEW DEPARTURE SEAL BEARINGS



DOUBLE N-D-SEAL | CONVEYOR ROLL BEARING | MINE CAR WHEEL BEARING | N-D-SEAL | REAR WHEEL

Solid Top Is Final Step in Attainment Of All-Steel Body

BY A. H. ALLEN
Associate Editor, STEEL



Two press operations are involved in drawing, forming flange and trimming the 22-gage steel sheet for the top

ALL-STEEL is a term which has been applied to automobile bodies rather indiscriminately; in a true technical sense, few models actually meet the description "all-steel". Soft tops, wood floor panels, wood reinforcing posts and other parts are used widely in body construction.

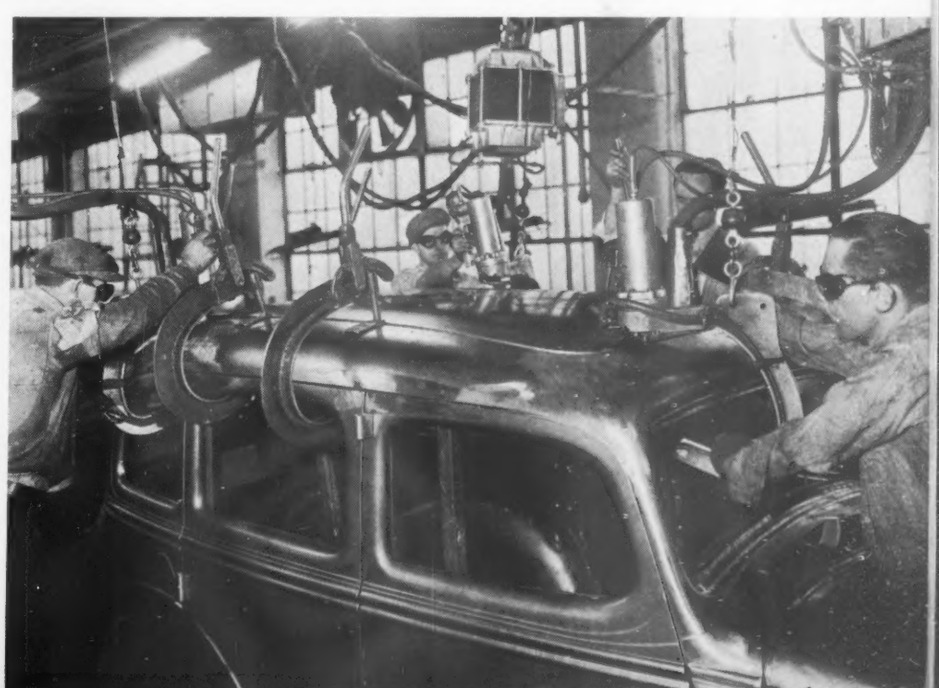
However, Hudson and Terraplane models for 1935 are all-steel in every sense of the word. Front, side and back panels are steel stampings, flash welded into a unit. Floor is a solid steel panel welded into the upper structure, this construction incidentally permitting the use of a lighter frame, with fewer cross members, as the floor provides structural strength. The top, too, is of steel, a solid formed sheet spot welded all around to the other units of the body.

This year probably will come to be known as the year of the steel top in automotive circles. While the idea of a steel top is not new (Hupmobile had an all-steel top in its 1914 coupe models), considerable engineering development has been necessary to overcome certain hitherto objectionable features of this top construction.

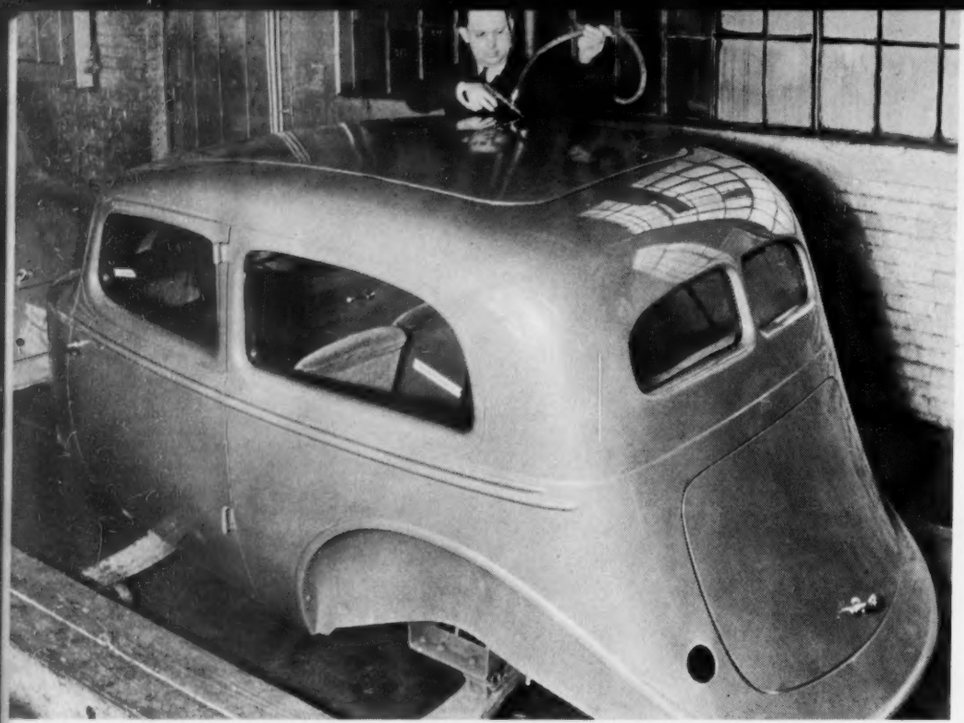
Noise probably has been the chief offender of the steel top. In previous years, vibration in automobiles had always been a problem. With the motor as the source, this vibration was easily transmitted through metal members, so that unless it was minimized by some method, the steel top became a veritable drum head, with resultant bad effect on comfortable, noiseless riding.

This difficulty has been overcome to some extent by mounting the motor in rubber, eliminating a large share of the vibration from this source, and by applying insulation to the under side of the top which deadens any bothersome rumble which might still be left. This insulating material also is effective in excluding heat in the summer and protecting against cold in the winter.

Steel tops for Hudson and Terraplane cars are fabricated and assembled at the Hudson body plant in Detroit. Sheet steel of 22-gage thick-



OPERATORS are spot welding the top sheet to the rest of the body while eight gage clamps hold the top in position



AFTER the body has been painted and brought to the assembly line, a ⅛-inch layer of deck sealer compound is applied to the channel around the top

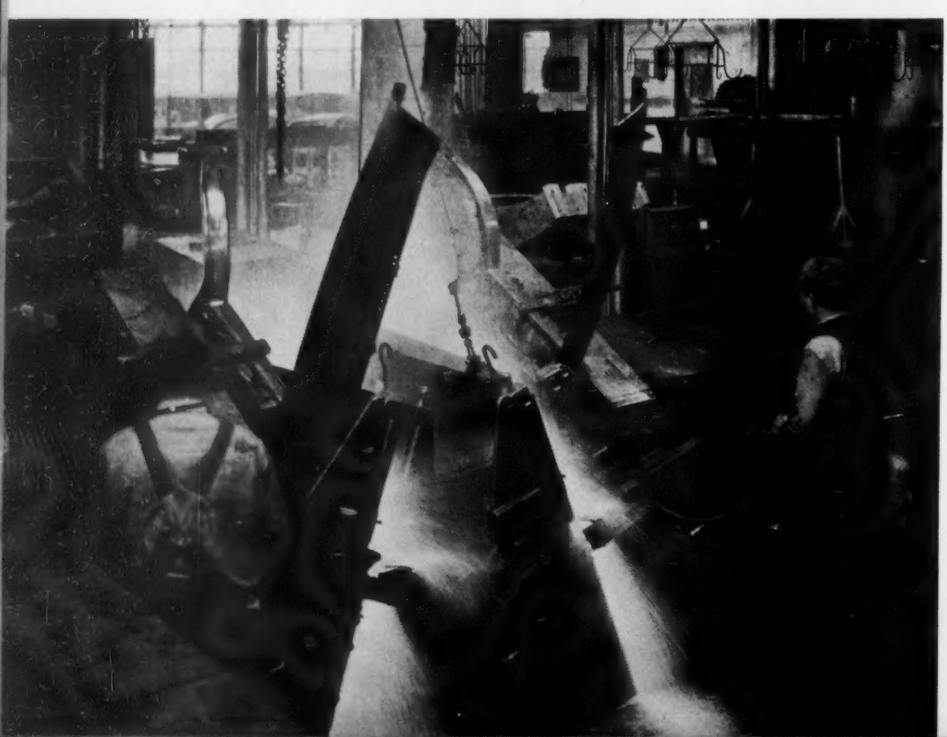
ness is used, comparing with 19-gage steel used in the rest of the body. A blank 47 15/16 x 71 inches in size is required for tops on the sedan models. On coupe models, the blank size is reduced to 36½ x 45½ inches. Thus the weight of the sedan top is about 23 pounds; of the coupe top about 10 pounds. An intermediate size, for coach models, weighs about 21 pounds.

Two press operations are involved in forming the top. First is a draw and first form flange operation, followed by a trim and finish form flange. Curvature of the sheet conforms to the curve of the upper portion of the side panels, and in addition to being arched from side to side, the top is arched from front to back. This is not the simplest of drawing operations. Dies must be designed to give a permanent set to all parts of the sheet, and great care must be taken to avoid any waviness in the finished sheet. A certain amount of springback also is encountered and dies must be finished to compensate for this. Engineers in the pressed steel department at Hudson devoted considerable research to determining proper clearances, die dimensions and other aspects of this work.

The first drawing operation is performed in a 410D Bliss double-acting press of 450 tons rated capacity, considerably in excess of the force required in the drawing operation. Area of the bed is 84 x 126 inches; area of the blank holder slide is 78 x 119 inches; and area of the punch slide is 59 x 107½ inches. Stroke down of the blank holder slide, with adjustment up, is 60 inches; stroke down of the punch slide, with adjustment up, is 63 inches. Blank holder stroke is 24 inches; punch stroke 35 inches.

The trimming and finish flanging operation is performed on a 9E Bliss single-acting press of 345 tons rated capacity. This unit is 122 inches between uprights, with bolster area of 46 x 120 inches. Area of the punch is 33 x 114 inches; stroke of the slide 6 inches. Distance from bed to slide, with adjustment up, is 18 inches. The sheet is reversed for the trim, following the first operation.

After the top is formed and inspected it is conveyed to the body assembly line for installation. Bodies have been assembled from the various units, including front and back panels, side panels and floor plate. Upper edges of the panels are formed with a flange or ledge about 1 inch below the top line. The flange of the top fits down on this ledge all around



FLASH welding of two rear quarter panels to a back panel is a spectacular operation in the assembly of an all-steel body

BETTER THAN DAYLIGHT

Better Sight during production

MINIMIZES INSPECTION REJECTS

A few ten-thousandths plus or minus are the limits of variation this industry can tolerate. Here at one of the final inspections they keep a constant check to see how well their production "tools" have done their work. Rejects are few, they have sealed the profit leaks at their source in the production line with Cooper-Hewitt light.

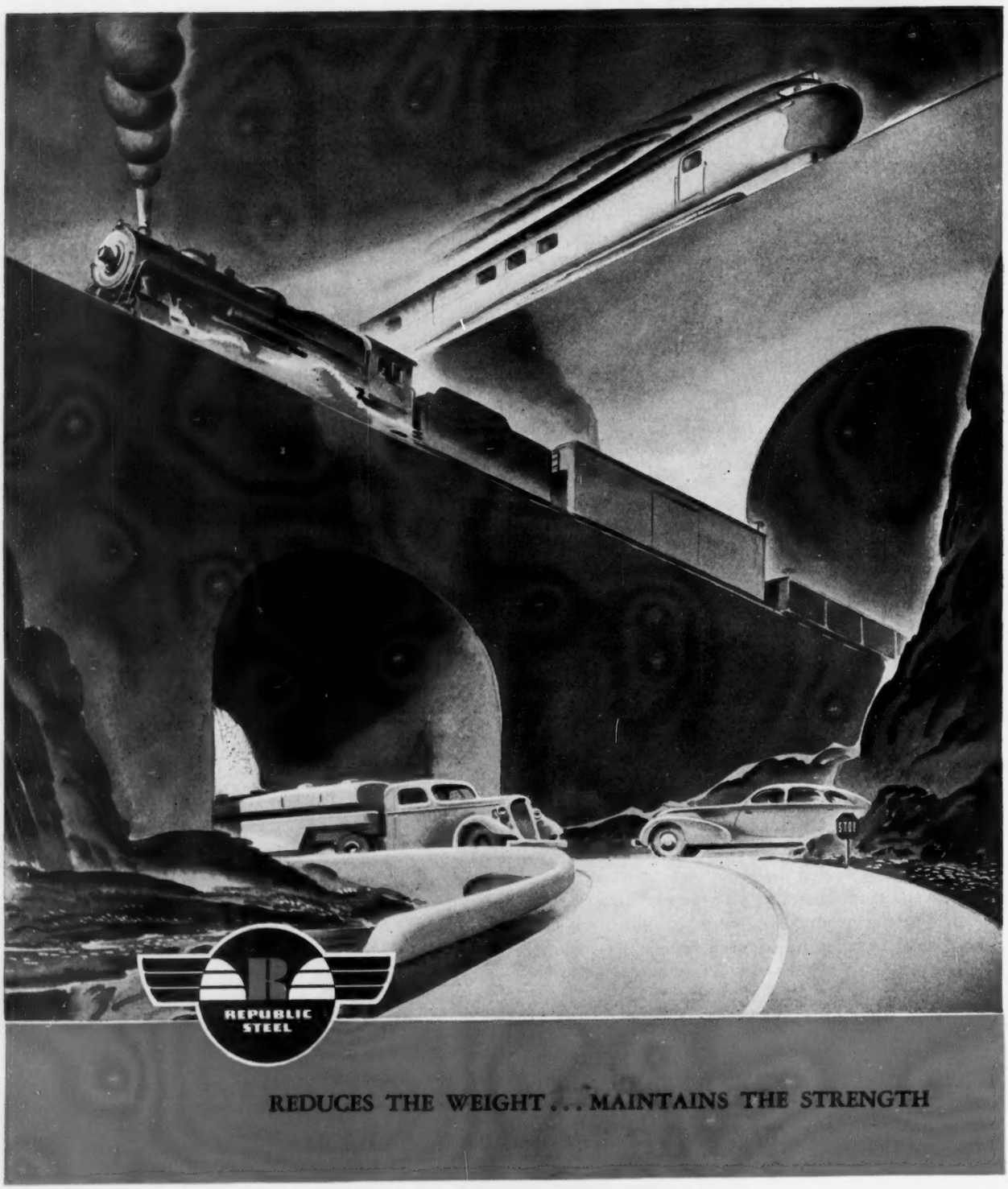
In the production line, glare has been banished. Detail is quickly seen, even in the shadows. Eye fatigue is unknown. A uniform high quality of production is maintained throughout the shift with the aid of the penetrating, soft light of Cooper-Hewitts.

They consider light purely as a production tool. It's an unusual production tool in that it directly affects the efficiency of every workman, every tool and every machine. Demand maximum production efficiency when you buy light. It's yours with Cooper-Hewitts. Don't take our word for this, nor the word of leaders in more than sixty leading industries. Demand proof — a trial installation in any department you choose. We welcome the opportunity... General Electric Vapor Lamp Co., 885 Adams St., Hoboken, N. J.

GENERAL ELECTRIC VAPOR LAMP COMPANY

622 Copr. 1934, General Electric Vapor Lamp Co.

These Steels are



well named . . .

REPUBLIC *Double Strength*

	Ordinary Carbon Steel	Republic Double Strength Grade 1	Republic Double Strength Grade 1-A
Yield Point	35,000 lbs. p. s. i.	60,000 lbs. p. s. i. min.	70,000 lbs. p. s. i. min.
Tensile Strength	50,000 lbs. p. s. i.	75.000 lbs. p. s. i. min.	90,000 lbs. p. s. i. min.
Elongation in 2 in.	25%	25% min.	18% min.

A moment's comparison of the physical properties of Republic Double Strength Steels and those of ordinary carbon steel is, itself, justification of the name and proof that one pound of steel can be made to do the work of two.

Here are two comparatively new steels that permit the use of 30% to 40% lighter sheets, strip or plates without sacrifice of strength or of safety factor—that make possible a reduction of dead weight in transportation equipment and increase revenue load capacity proportionately.

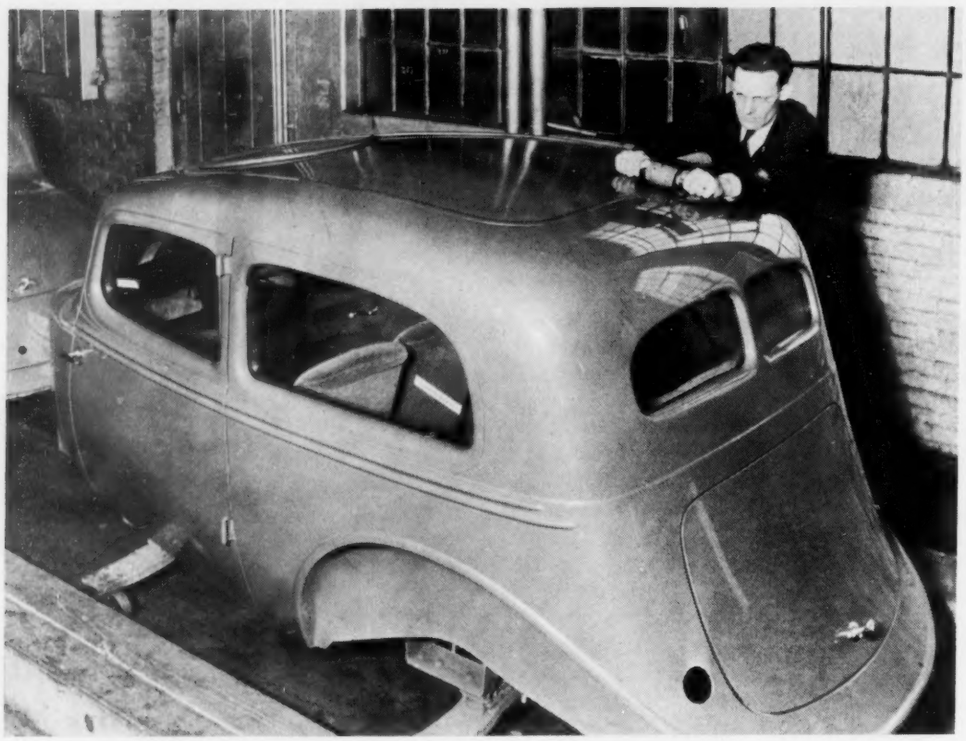
Cold forming tests have shown the superiority of Republic Double Strength Steels from the standpoint of ductility over similar products with the same physicals. Tempering increases their yield points 20,000 to 30,000 pounds over the figures shown here. They can be arc, gas or spot welded with the least change in ductility at or adjacent to the weld. There is no air hardening, hence more safety in fabrication. And because of their copper, nickel and molybdenum alloy content, they will resist corrosion far better than ordinary carbon steels and show a life equal to or greater than that of the heavier sections which have been standard practice in the past.

These steels are destined to play an increasingly important part in the construction of new transportation equipment and in the modernizing of old. We shall be glad to furnish more detailed information on request and to make recommendations covering their use for specific applications.

REPUBLIC STEEL

Republic Steel CORPORATION

GENERAL OFFICES · · · YOUNGSTOWN, OHIO
CENTRAL ALLOY DIVISION · · MASSILLON, OHIO



TO FINISH off the top, a strip of rubber molding is rolled into the channel. Color of the molding matches that of the body

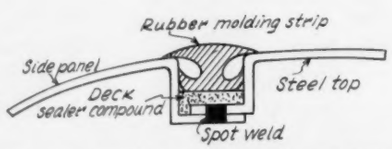
the body, forming a channel or gutter about 5/8-inch wide and 3/8-inch deep around the top.

After the top has been lowered in place on the body, eight gage clamps are fitted on, three on each side and one on each end. These clamps fit into the channel on the top and come up under the joint on the inside. Gage blocks in the channel insure accurate and uniform spacing of the top, while the clamping member holds it securely in place for welding.

At this point, several gun welders, supported on monorail conveyors over the assembly line, are brought to the body, and by means of special yokes fitting in through window and door openings the top sheet is spot welded around its entire edge. The welds are made fairly close together, about 1 inch apart on the sides and even closer around the corners, the latter being rounded. As the spot welding is being completed the gage clamps are removed and taken back to the next body on the line.

The bodies then proceed through the customary cleaning and painting operations, following which they are transferred over a distance of about a mile to the Hudson final assembly plant on East Jefferson avenue. As the bodies are received here, the first operation is to apply a layer of deck sealer compound in the channel around the top. An air gun is used for this work, equipped with a special flat nozzle, which directs a layer of the compound into the channel, to a depth of about 1/8-inch. The compound must be kept warm while it is being handled, so a small steam line is coiled around the hose which carries the compound from the storage tank to the gun.

As the bodies proceed down the trim assembly line, the next step is to apply a layer of insulation material to the under side of the top. Strips of soft insulation felt are coated with a special cement and placed over the entire interior of the top, providing an effective deadening agent against noise, heat and cold. The dome light support and bows then are bolted in place and the bodies move on down the line for upholstery and inner trim. The head liners of upholstery material are applid over the inside of the top, stretched tight so that they are about 1-inch away from the under side.



Sketch showing cross section of steel top construction, with weld, deck sealer and molding strip indicated

Just before the bodies are ready for lowering onto chassis, a strip of special rubber molding is rolled into the channel around the top on the outside. This molding is of a special section (see accompanying sketch) and when in place the joint between top and body is not noticeable, except for the rounded surface of the rubber molding. The latter is supplied in a number of colors to match the paint color on the body.

The solid body shell is now ready for assembly to its chassis. It is picked up by speedy monorail carriers, using rubber covered hooks. A hoist raises the chassis from one floor below to the final assembly line, and the monorail carrier transfers the body across the elevator opening and down onto the chassis. A neat job of scheduling is apparent at this station, for as the bodies come off the trim line, a matching chassis must be ready on the floor below. When it is considered that about 500 bodies are handled every 8-hour day, on two assembly lines, this task of scheduling bodies and chassis in the correct sequence can be appreciated.

Alloy Cast Iron Is Used For Automobile Jacks

Nickel iron castings are used in an automobile jack developed by the Walker Mfg. Co., Racine, Wis., especially for the newer designs of cars with extended splash aprons, sweeping beaver tails, lower chassis, and knee action. The alloy castings, produced by the Wisconsin Cylinder Foundry Co., Racine, Wis., have the following analysis: Total carbon, 3.20-3.30; manganese, 0.50-0.60; silicon, 1.30-1.50; and nickel, 1.50-1.60 per cent. In the mix, 50 to 60 per cent steel is used.

Monel metal welding rods or electrodes customarily are used to repair defects in gray iron and steel castings where a color match is important.

STEEL
Again sweeps
TRANSPORTATION FORWARD

DESTINED to revolutionize the economics of weight reduction, U S S High Tensile Steels are the culmination of the most extensive research and engineering, which have brought forth such remarkable, high-strength, highly corrosion-resistant alloys as U S S COR-TEN and U S S 18-8—to mention but two of the several grades in the series.

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USS HIGH TENSILE STEELS

METHODS AND MATERIALS

Tests for Cracked Press Crankshafts

CRANKSHAFT breakage is a serious hazard in the operation of power presses, therefore, every precaution should be taken to prevent failure if possible and to provide a guard to retain the flywheel in event of shaft breakage. Commenting upon this subject in the February issue of the *News Letter* of the power press section, National Safety council, J. J. Hurley, manager, Englewood plant, American Can Co., Chicago, recommends tests for cracks in press crankshafts.

The flywheel should be slid about halfway off of the shaft, or if necessary for safety, depending on the type of press, remove it completely. It is of utmost importance that if this test is made without completely removing the flywheel from the shaft, due precaution must be taken to make certain that the wheel is not more than halfway off, and furthermore that some positive method be employed to prevent the wheel from slipping off while the test is in progress.

Clean the exposed part of the shaft thoroughly, particularly at the clutch collar fillet, as hazardous breakage usually occurs through this section. Apply a coat of quick drying whitewash to the exposed part of the shaft. A crack may be detected by penetration of oil through the dried whitewash. Make close observation at the clutch collar fillet. When the press has been dismantled for repairs and the crankshaft completely removed, the same test should be made on the crank side of the clutch collar and also at the bearing and crank fillets.

In addition to the foregoing, before the crankshaft is assembled at the press, and as a supplementary check, it will be expedient to make a sound test. To test by sound, suspend the shaft alone by means of a rope, so that it hangs free; then tap it lightly with a hammer. A cracked shaft will not ring as clearly as a solid one.

\$ \$ \$

High Tensile Steel Is Resistant to Corrosion

A new high tensile steel, claimed to be corrosion resistant and rust proof, has been developed and placed on the market by the Rustless Iron Corp. of America, Baltimore. Supplied under the identification RR-11, this steel is intended particularly to meet severe requirements of railway and mining service. It also is said to be available at comparatively low cost. Physical properties are stated to be as follows: Yield point 45,000 to 85,000 pounds per square inch, tensile strength 75,000 to 120,000 pounds per square inch, elongation 30 to 15 per cent in 2 inches. According to the manufacturer, the new material may be welded and can be worked hot or cold.

\$ \$ \$

Enameling Furnace Given Insufficient Air Supply

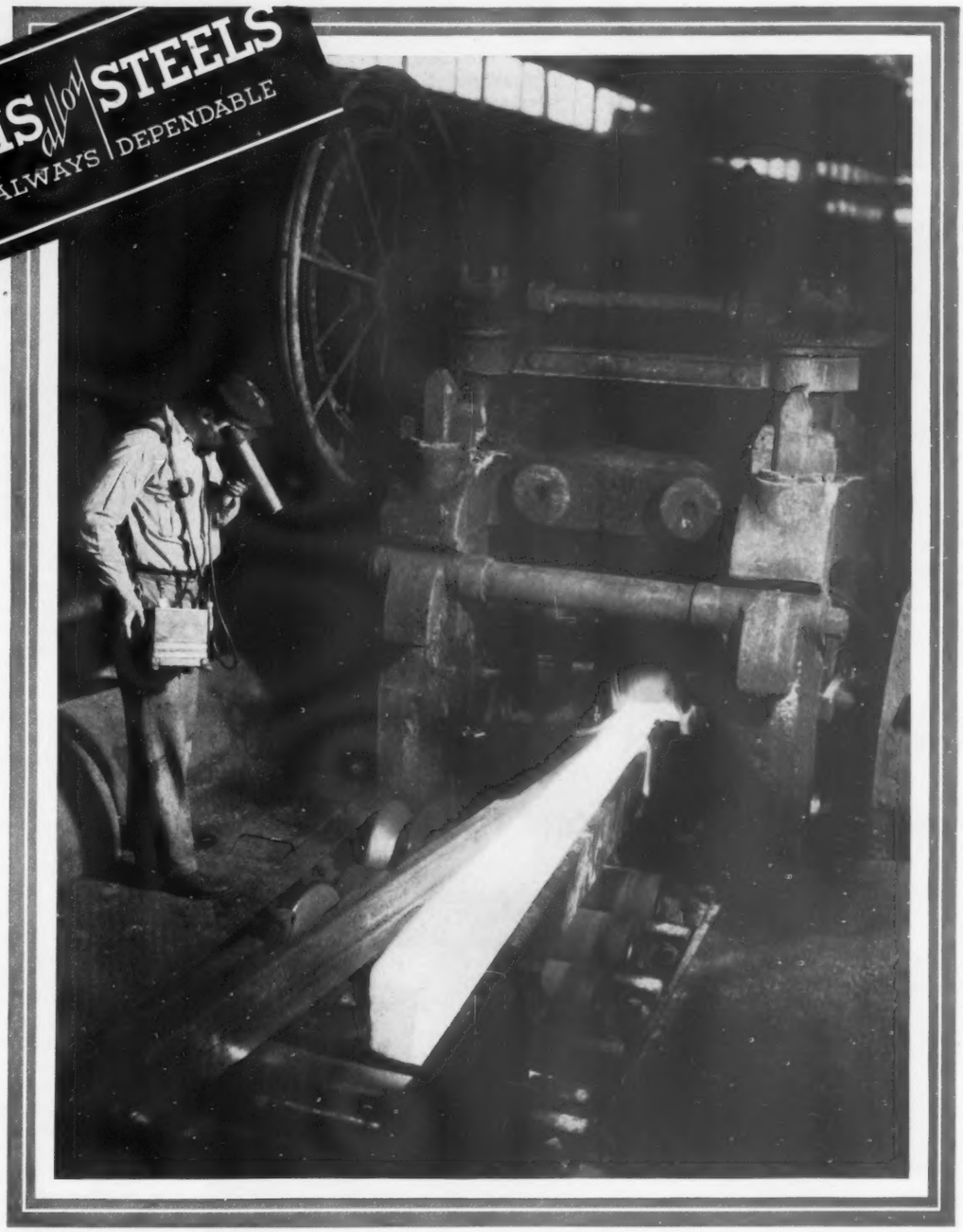
A porcelain enamel service engineer was called into a plant to discover the cause for copperheading and blistering on sheet iron ground coat enamel. After the water used with the milled enamel and in the pickling bath had been checked without a suggestion as to the cause of the trouble the investigation turned to the burning furnace.

The furnace was very tightly constructed and had a minimum of heat losses through cracks, door openings or vents. On the theory that there might be insufficient free oxygen for the burning operation, or an accumulation of injurious gases volatilized

Steel Panel Home

PREFABRICATED STEEL PANEL HOME recently completed by General Electric Houses Inc., Chicago. This house, erected in Riverside, Chicago suburb, is the fourth of this kind to be built in the Chicago area. The dwelling has five rooms, an attached garage and part basement. Outer walls are of 14-gage copper-bearing steel sheets, the panels being bolted together. In all, about 10 tons of steel is contained in the house. Steel walls and efficient insulation are important factors in effecting low heating cost. Insulation includes 3½ inches of rock wool applied between the inner and outer walls. An interesting interior feature is the use of an aluminum mantel fireplace

ILLINOIS alloy STEELS
ALWAYS DEPENDABLE



SCIENCE SAYS "*THUMBS UP*"

● There goes a billet of Illinois Alloy Steel, two seconds out of the pre-heating furnace, entering the first stand of rolls. What's its temperature? The pyrometer will tell. For every billet must enter the mill at a precise temperature. Heat and speed are controlled exactly in this mill to assure the physical qualities required in the finished steel.

Part of the job is in the heating furnace. There modern design and modern control assure uniform heating throughout every inch of the billet. Then, in the mill itself, a constant watching of rolling speeds and repeated checking of temperatures brings the finished stock out on to the cooling bed in accordance with the dictates of the metallurgist.

Illinois' alloy mills have been modernized in every particular. We know of no other mill practice which so safeguards the mechanics of rolling or the quality of the steel it produces.

ILLINOIS STEEL COMPANY
208 SOUTH LA SALLE STREET, CHICAGO, ILLINOIS
United States Steel Corporation Subsidiary

from the enamel itself, several loads of ware were fired with the furnace door partly open. A slight improvement in results was apparent.

The service engineer then had a compressed air line introduced into the back end of the furnace near the bottom, which provided a gradual flow of air into the chamber, displacing other gases present. An immediate improvement in results was obtained and a second small air line, when installed, entirely eliminated the trouble. The solution, then, was either to feed the necessary amount of compressed air into the furnace, or cut a vent hole in the top.

\$ \$ \$

Copper, in Liquid Form, May Be Used as Paint

Discovery of a new chemical process for reducing copper to a noncrystalline form, suitable for use in a liquid vehicle and giving in effect, the equivalent of liquid copper, is announced by H. M. Rice, metallurgist and manager of the Nichols Copper Co., 230 North Michigan avenue, Chicago, a unit of the Phelps Dodge Corp.

By the new process, the metal, 98.3 per cent pure, now can be applied in this liquid manner, Mr. Rice reports, to form a virtual sheath or armor of copper upon almost any surface. The new product, he states, is not to be confused with common oxides or bronze powders.

By virtue of the shapeless form of the tiny copper particles which are so small they penetrate a 350-mesh screen, no minute gaps are left in the coating after application by spraying, dipping or by a brush, it is stated. The copper remains in suspension in the special vehicle that has been developed, assuming an approach to a semi-colloidal state.

Laboratory and field tests are reported as indicating that the product should have a useful life of 4 to 10 years and possibly longer. It is said also to be highly resistant to acid and other corrosion. Discovery of the process is credited to L. D. Pangborn and Harry Sweney, research workers who are attached to the laboratories of the Nichols Copper Co. in Chicago.

New York District Is Only Market for Certain Fabricated Steel Products

SEVERAL steel products, not readily available elsewhere, are shipped into the New York district by the carloads from a number of middle Western manufacturing plants. Altogether, this business runs into substantial tonnages.

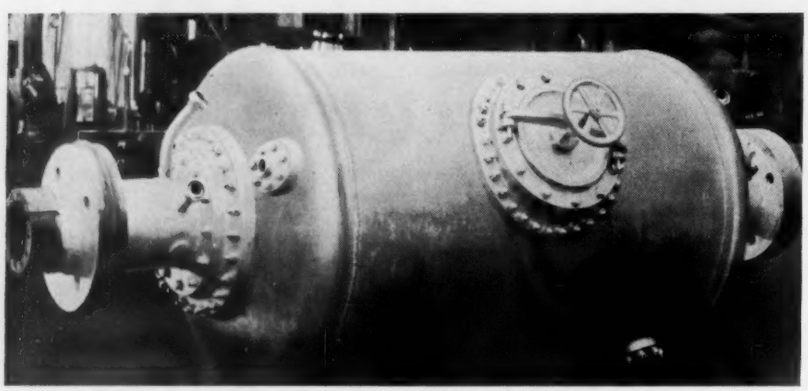
Among these products are porcelain enameled steel bathtub covers. They are sold only in New York. This business had its inception in the fact that many thousands of old apartments in that city originally had no toilet or bath accommodations and a ruling by the sanitary commission prevented the renting of these apartments unless they were equipped with sanitary facilities. Owners usually found their way out of this situation by building a little platform in the kitchen and mounting a bathtub upon it. Then somebody thought of putting a cover on these tubs, the result is a porcelain enameled steel table top which may be slipped over the bathtub, making the latter a useful article of furniture in the kitchen as well as a sanitary adjunct.

Covers for Laundry Trays

Laundry tray covers also are sold by the thousands, exclusively in the territory within a radius of 150 miles of New York's city hall. The reason is that laundry trays in the small apartments in congested Eastern centers ordinarily are placed in the kitchen. These covers usually are of porcelain enameled steel and are hinged over the trays so that when the trays are not in use, the tops serve as clean, sanitary, kitchen tables. Manufacturers of such covers have given thought to pushing their distribution in other sections of the country. Although, outside of New York, the laundry trays usually are in basements, both in private dwellings and in apartment houses, the manufacturers believe that is no reason they should not be covered, since such covers would not only keep the trays clean but would prove useful as tables.

Breakfast sets with porcelain enameled tops and disappearing leaves constitute another product whose sale is confined to the East. These breakfast sets can be purchased in some of the larger Middle Western cities, provided the purchasor has plenty of time to find a store which stocks a few of them. This is in contrast to New York and nearby eastern cities where every department store, furniture store and many other smaller establishments carry wide selections of these breakfast sets. The popularity of these sets, of course, again finds its inception in the extent to which the kitchen is a combination eating place and reception room in a vast number of New York's appartments.

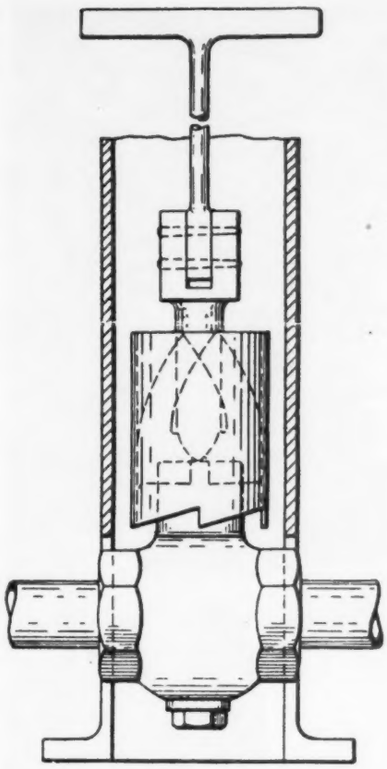
For Your Breakfast Food



CEREAL COOKER OF STAINLESS CLAD STEEL: After a year's operation of a trial unit, a large cereal manufacturer recently ordered a second of these cookers of 18-8 stainless-clad steel. About 6 feet long and 4 feet in diameter, the cooker is of the revolving type, the cereal being cooked by live steam in the presence of salt. This mixture is found to have no corrosive action on the stainless steel interior. Shells are of all-welded construction. Waterous Ltd., Brantford, Ont., was the fabricator. Ingersoll Steel & Disc Co. division of the Borg-Warner Corp., Chicago, supplied the stainless-clad steel

Wrench Shuts Off Water Lines When Pipes Freeze

As a result of the extreme winter cold in New England in the past few years, freezing of water pipes at times has assumed the proportions of an epidemic in that section. Many of the curb boxes had not been opened for years and were full of silt and gravel, making the usually simple task of turning off water a laborious proceeding. One of the sufferers from such trouble was the Hjorth Lathe & Tool Co., Woburn, Mass., which met



New cast steel wrench simplifies task of shutting off water lines during freezing weather

the situation by developing a new tubular valve wrench.

It function shown in the sketch reproduced above. When the wrench is turned around by manipulating the handle, the spirals inside and the teeth at the bottom loosen and hold the damp sand and gravel, allowing this muck to be brought to the surface. As the wrench digs its way into the silt and gravel, it locates and engages the shut-off valve; it grips the valve properly on centers, so that the ears of the valves do not break off.

The wrench is a steel casting, made of low carbon, crucible steel. The carbon content varies between 0.30 and 0.40, with sulphur and phosphorus as low as possible. Developed and patented by the company for its own use, and then placed on the market, this product was sold extensively throughout New England last winter.

Hard Facing Reduces Wear Of Bearing Thrust Rings

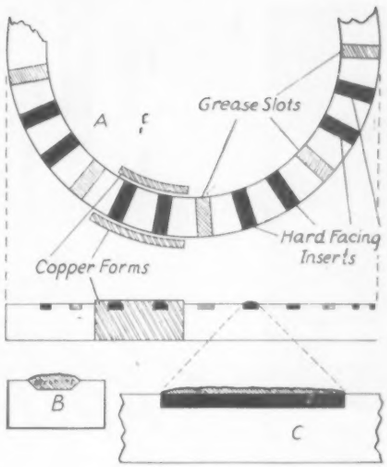
Elimination of wear on thrust rings for roller bearing installations is one of the uses to which hard facing material—in this case Stoodite, a product of the Stoody Co., Whittier, Calif.—has been of assistance to engineers. When this application first was considered, the intention was to surface the entire face of the ring with the material and then grind the surface to the proper finish. In experimenting, however, inserts were found to serve the purpose equally as well and in addition they reduced the cost.

Inserts are made by planing or milling grooves across the face of the ring, as shown in sketch *A* of the illustration at the right. On the first rings to undergo this procedure, a groove with square shoulders was employed as shown in sketch *C*, but tests revealed that better results could be obtained by relieving the corners of the groove and cutting it out as shown in sketch *B*.

Grooves May Be Shortened

If the ring contains grease slots, the grooves containing the hard facing material are spaced between them. Grooves may run entirely across the face of the thrust ring as shown, or may extend only part of the way across the face, leaving a wall of original metal on the inside of the ring. The object in cutting the groove only part way through is to eliminate the possibility of the hard facing metal projecting over the edges of the ring, making it necessary to grind the inside as well as the face of the ring.

Use of forms made of copper plate, however, will obviate any difficulty of projecting edges inasmuch as they serve as dams at both ends of the slot. The hard facing metal does not adhere to copper. Stoodite is used with the metallic arc and is deposited in the groove. Either bare or coated electrode may be employed. Best results, however, are said to be obtained with the coated electrodes due to the fact that some undercutting is found on the groove edges when deposits are made with bare electrodes.



Inserts of hard facing material obviate wear on thrust rings for roller bearings

Improvement in Design Brings Better Production

A change in design of an automatic key punch machine increased the production from the machine 33 per cent and reduced the occurrence of errors by 22 per cent. This machine, used by the General Electric Co. at Nela Park, Cleveland, for recording information by punching holes in cards, originally was equipped with a cast table, with cast legs, and without any surplus desk space or drawers.

The steel desk shown in the illustration below was designed by Wilbur Henry Adams & Associates, industrial designers, Cleveland, with

Formerly set in plain cast iron table with plain cast legs, this automatic key punch machine now is fitted with a specially designed cut-out desk

The work's half done when you use *Rolled Steel*

for the CONSTRUCTION OF MACHINERY

. . . and done exceedingly well. Rolled Steel is a thoroughly worked product, free from blow holes and other imperfections. It comes to you ready for immediate fabrication. There is no time lost on patterns, foundry delays and rejections. A wide variety of parts can be made from a very few selected sections. Your inventory, therefore, need not be large. The strength of Rolled Steel is a computable factor, thus the completed machine is adequate for its purpose—without excess weight, and excess transportation costs.

Those concerned with the design and manufacture of modern machinery will find the Carnegie Shape Book a helpful publication. It contains profiles and physical data on a wide variety of Rolled Steel Sections. May we send you a copy?

Blooming Mill Engine Frames of Welded Rolled Steel. Photo courtesy of The William B. Pollock Company.

324

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a cut-out top to receive the operating mechanism and with soft rubber under the mechanism in order to reduce noise of operation. A lighting fixture was provided for illuminating the copy from which the operator punches cards. An adjustable paper rest and an increased amount of leg room resulted in improved posture and less fatigue on the part of the operator. In addition, the left portion of the table top and a set of desk drawers were made available for the use of the operator.

Develops New Series of Straight Cutting Oils

A new series of straight cutting oils, combining refrigeration and high film strength, has been announced by E. F. Houghton & Co., Philadelphia. Research study has determined the conclusion that modern cutting oil must have a high degree of heat absorption and further must provide an enduring film of oil on the tool, thus substituting fluid friction for plastic friction, which in turn reduces the amount of heat generated. Cutting oil must be fluid so that it will penetrate quickly, back of the cutting edge of the tool, which progresses at high speed; and further it must have a high film strength to withstand extreme pressures exerted on the tool.

Because the cutting oil is used over and over again, it is imperative that the physical and chemical properties remain unchanged.

All of these qualities are claimed to be embodied in the new series of oils developd by the Houghton company. Further details are available from the manufacturer.

High Chromium Cast Irons Can Be Made in Cupola

In addition to the high chromium cast steels, usually made in the electric furnace, there is now on the market a series of high-chromium cast irons. The development of ferrochromium briquets has made possible the economical cupola production of cast irons containing 15 per cent chromium or more. Cast irons containing 15 per cent of chromium and over are resistant to oxidation up to temperatures of 1500 degrees Fahr. and also resist growth. They are not intended to replace the high chromium steels because they lack the strength of the steels but they have ample strength for applications such as stoker bars and incinerator parts not subjected to excessive stresses or shocks.

Chromium is added to cast iron in amount up to 35 per cent. Up to 1 per cent is used to increase hardness and strength either with or without other alloys.

Actions and Reactions

IN THE WELDING FIELD

BY ROBERT E. KINKEAD

Concoctions

THERE is a presumption that a weld which has failed was defective. In litigation and in the mind of the public this presumption is so strong that it is practically useless to offer evidence to the contrary. The same presumption holds if the failure occurs within perhaps ¼-inch of a weld.

This situation is of importance in fixing welding design, methods specifications, and material specifications. Thus, a material may have very desirable physical properties for a certain purpose but if its welding properties are such as to make it probable that when failure occurs it will be immediately adjacent to the weld, there would be a reasonable doubt raised as to the advisability of using such material.

All metals can be welded but a good many of them are practically useless after they are welded. This should be given due consideration by the metallurgists who are concocting alloys which contain a little of everything including the kitchen sink.

* * *

To Pay the Piper

THE final net result of the experiments of Tugwell, Johnson, Moley & Co. will be simply that manufacturing will have to be enormously more efficient than ever before in order that the financial burdens of the experiments may be carried. When we get out of this mess, it will be because industry is producing wealth faster than the federal administration is permitted to spend it.

We presume that the same thing is happening in all the technological processes that is happening in the welding processes. The need for more production per man hour has brought out new equipment, new methods and new materials. Competition forces these developments. A man is crazy to compete with a fellow who can weld 15 inches of 1-inch thick steel plate per minute by machinery when all he has is a manual process which requires 30 minutes to weld a foot of the same plate.

Business men and politicians have had their fling at settling competitive battles in the light of love and sweet reasonableness. It does not work. Humans have not walked on their hind legs long enough to settle things that way. The way to deal with a competitor is to do a better job at less cost by use of brains and machinery.

* * *

Short Shorts

Welding rod sells at prices ranging from $100 to $3000 per ton. There are probably 500 different trade names used for welding rod.

* * *

Total sales of welding machines, gas, welding supplies for all processes are far in excess of corresponding sales in 1928.

Introducing the Author

THIS column, which henceforth will be a regular feature of STEEL, *is the natural outgrowth of a series of intimate letters issued periodically to the welding fraternity by the author, Robert E. Kinkead, beginning about ten years ago. During the past four years, the series was continued in a monthly welding journal.*

Mr. Kinkead, well-known consulting engineer in welding, writes from a broad experience gained through many years of grappling with the welding problems of many large fabricating and manufacturing concerns. He writes boldly and his observations are provocative enough to focus the reader's thoughts upon the fundamental aspects of the more important problems of welding.

In this and subsequent columns, he will be given wide latitude in presenting his views, which will not necessarily coincide with those of the editors of STEEL.

—The Editors

LARGE USES OF STEEL IN SMALL WAYS

283rd Article ◆ Wire Rope Clips

SOME form of fastening is required in practically all instances where wire rope is used. This fastening may be one of several different types, the principal ones being the hot metal socket, the Fiege socket and the wire rope clip.

The hot metal socket, as its name implies, is a socket in which the end of the rope is inserted and the untwisted strands are imbedded in molten zinc. Such a fastening commonly is used with passenger elevator cables. Fiege sockets, a fastening of fairly recent development, use a cone plug, sleeve and socket to provide a tight grip on the strands.

Clips account for about 85 per cent of all wire rope fastenings sold today. They consist simply of a U-bolt and base which are drawn together by tightening two nuts on the legs of the bolt. Cables inserted between the bolt and base are prevented from slipping by the resulting friction created by the close fit. The base is formed with channels or ridges which offer further resistance to withdrawal of the ropes.

Applications Widespread

These clips find extensive use in a number of industries. Construction work, where hoisting of heavy material is necessary, offers a substantial market. Other important outlets include the logging, mining and quarry industries as well as oil well drilling. Coal mines use large clips for hoisting cables.

Most clips are made of drop-forged steel. Some are malleable iron castings, this material accounting for about 25 per cent of total production. Sizes of clips vary according to the diameter of rope with which they are to be used, usually ranging from 3/16 to 3-inch. Special sizes also are available. The most commonly used sizes are ⅝ and ¾-inch, weighing about 1 to 1½ pounds each. Clips for 3-inch rope weigh about 23 pounds, and the smallest sizes weigh slightly over ¼-pound. While exact figures are not available, it is estimated that annual production of wire rope clips in an average year involves the consumption of more than 500 tons of steel.

Manufacture of this product involves forging, machining and bending operations. The base is drop-forged from plain carbon steel. Bar stock for the U-bolt is cut to size, the ends are threaded and the piece is bent. The latter work is done cold on small diameter bars and hot on larger sizes. The two parts then are galvanized and assembled.

It is estimated that 500 tons of steel is used in an average year in the manufacture of wire rope clips. Made by drop forging, the most common sizes are ⅝ and ¾-inch, and weigh from 1 to 1½ pounds each

Latest Thought on Best Methods of Steelmaking

Physical Chemistry of Steel Making, by C. H. Herty Jr. and associates; cloth, 373 pages, 6 x 9 inches; 116 illustrations; published by Mining and Metallurgical Advisory board; supplied by STEEL, Cleveland, for $3, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

Accomplishments of the metallurgical advisory board and Carnegie Institute of Technology, as presented from time to time in bulletins, have been gathered into this volume, which represents the best current thought of the industry.

Present accomplishments in knowledge of the physical chemistry of steels, particularly the study of nonmetallic inclusions, are given as follows by the board: Determination of the solubility of iron oxide in pure iron and the correlation of the iron oxide content of open-hearth steel with this solubility curve, including the development of the aluminum method for determining in a relatively short time the iron oxide in steel and the determination of the relation between carbon and ferric oxide contents in liquid steel and slag composition; development of practical methods for controlling the iron oxide content of open-hearth slags; completion of the entire program on formation and identification of nonmetallic inclusions whose base is FeO, and work on deoxidation with manganese-silicon alloys; development of the electrolytic method for determining nonmetallic inclusions in steel; determination of melting points and viscosities in various slag systems, these forming a solid foundation for future work on deoxidation and slag manipulation in the open-hearth furnace; application of the above to open-hearth work in the production of steel of greater cleanliness than has been obtained by present-day steelmaking practices; effects of deoxidation on grain size and grain growth, hardenability, impact strength at low temperatures, and aging have been investigated, with immediate applications in practice.

The volume contains a bibliography, a combined table of contents of bulletins 64-69 and a list of all bulletins on co-operative mining and metallurgical investigations.

Arguments on Both Sides Of Munitions Question

Arms and Munitions, by Joseph H. Baccus and Egbert Ray Nichols; cloth, 200 pages, 5½ x 7¾ inches; published by Noble & Noble, New York; supplied by STEEL, Cleveland, for $2, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

Prevention of international arms shipments is much to the fore at the moment, with government investigation of war profits and the selection of this question as the subject for debate in the large forensic societies for 1935.

In this volume the editors have assembled the principal arguments, both affirmative and negative, on the question. Designed especially to aid the debater, whichever side he may represent, it is also of the deepest interest to the student as in it is gathered much material difficult of access to the ordinary reader. This includes league of nations reports, congressional resolutions on export of arms, contraband of war as specified by the London naval conference and many other sources of information not readily obtained.

A bibliography is included, covering books, magazines, pamphlets and sources where additional material may be obtained.

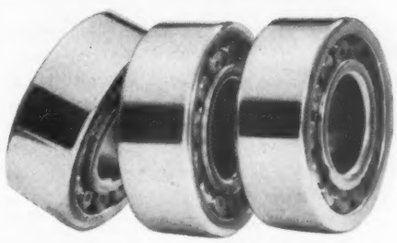
IF IT HAS SKF, IT HAS

ROLLING ACCURACY

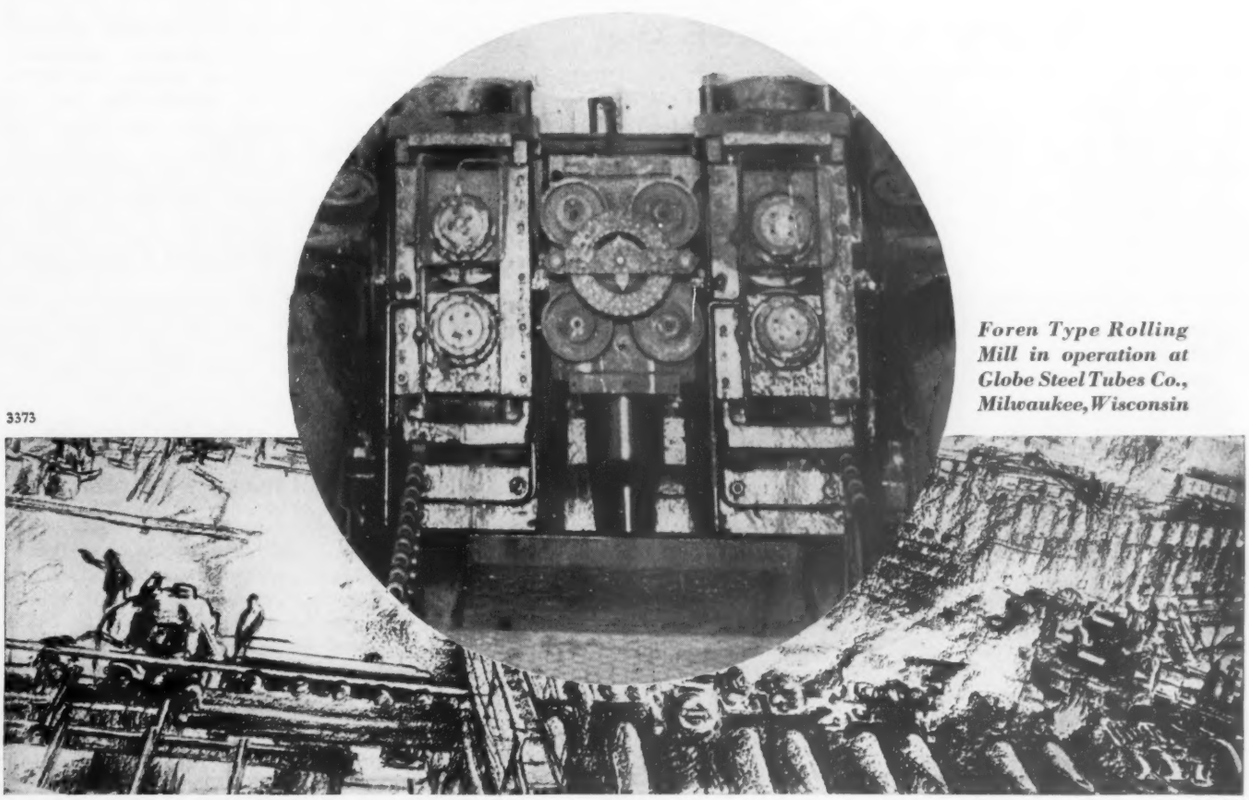
SKF Spherical Roller Bearings perform beyond the fondest expectations of Globe engineers who specified them for 84 roll-necks and drive gears and pinions on this Foren type rolling mill. And they carry on every day with low-cost precision that means uniform product.

They're designed to obtain the compactness and greater capacity of the roller bearing, at the same time retaining the ball bearing's smoothness and low friction that leads to less sliding, less wear and heating, and longer life. They never need adjustment . . . run for long periods on one lubrication . . . and meet all demands for performance. So send up your profits by bringing your product up to the high standards of SKF! Merely specify SKF performance! SKF INDUSTRIES, INC., Front Street & Erie Avenue, Philadelphia, Pennsylvania.

SKF

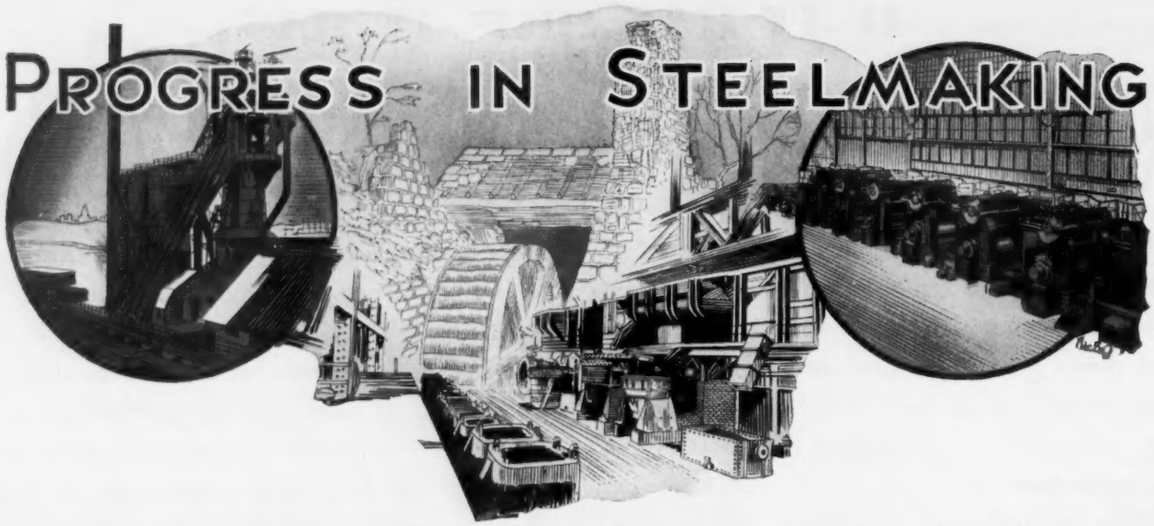


ROLLER BEARINGS



Foren Type Rolling Mill in operation at Globe Steel Tubes Co., Milwaukee, Wisconsin

3373



Minimizes Fire Hazard

Charcoal used in the header box of wire drawing equipment is treated at some plants with Crisco or suet which has been boiled and mixed with 50 per cent water.

◆ ◆ ◆

Affords Low Repair Costs

Repair of a large steel frame alligator shear by bronze welding recently effected a saving in excess of $1000 in addition to the time that would have been lost because the shear was out of service waiting for new casting. About 600 pounds of manganese bronze was put into the weld. The total cost of making the repair including all the labor and material was less than $350.

◆ ◆ ◆

Protects Metallic Parts

Tests to find the most economical method of protecting bright steel parts of stored or idle machinery at iron and steel plants have been conducted for over five years at an English laboratory. According to the findings the most satisfactory method is to coat the metallic parts with partially refined lanolin. This is prepared from wool grease and is a waste product of the wool-combing industry. The method recommended is to dissolve the lanolin in solvent naphtha. The proper mixture is 8.310 pounds of lanolin dissolved in 1 gallon of the naphtha. This quantity applied to the metal with a soft brush will cover approximately 1200 square feet.

◆ ◆ ◆

May Adopt New Practice

Controlled furnace atmospheres may be adopted by plants engaged in forging and where steel necessarily is exposed to the air during these operations, according to a Detroit metallurgist. Elimination of hammered or rolled in scale would be an advantage. Many axle shafts retain the original bar size over most of their length and since the greatest fiber stresses are in the outer layers, elimination of the carburization will increase the strength greatly.

◆ ◆ ◆

Installs Welded Pipe Line

All pipe being installed at a new continuous tin mill in Ohio is being oxyacetylene welded to hold maintenance work to a minimum.

◆ ◆ ◆

How Tanks Are Protected

Acidproof masonry linings in steel tanks provide protection against various chemicals if the steel is coated carefully with ¼-inch layer of a chemically-tested acid-proof cement. Circulation of acid between the brick work and the steel thus is prevented. Corrosion is merely a surface effect where the insoluble salts clog the pores of the brick work and prevent further penetration of acid.

Sampling an Open-Hearth Heat

STEELMAKING INVOLVES SKILL AND EXPERIENCE—With blue glasses shielding his eyes from the brilliancy of the flame and shirt sleeves rolled down to protect his arms from the searing heat, the melter thrusts a long-handled ladle through the peep-hole in one of the charging doors, pushes the slag floating on the bath to one side, and scoops up a ladle full of metal. Backing away from the furnace he pours his "brew" into a rectangular mold. The sample when cool is broken in half and the melter observing the grain structure exclaims: "We're on the high side." How can he tell by looking at the test sample that the percentage of carbon is too high? Only by years of experience

Courtesy, Bethlehem Steel Co.

ADVERTISING PAGES REMOVED

Revised Specifications for S.A.E. Steels Approved and Announced

(*Concluded from Page* 32)

inch, or even higher, and have available a choice of two or more compositions every step of the way. Excellent alloy steels are now provided for the heaviest of automotive sections. Hence, the engineer or the metallurgist is not confined to a single type of steel or to a single supplier.

It is well understood at this late day that composition, as measured by the elements covered in these and other chemical specifications, is not synonymous with quality. The elements commonly included in specifications of this character enable the user and the maker to arrive at a common understanding as to the type and grade of steel desired. The particular quality a purchaser requires will depend upon additional factors that cannot be specifically defined in a general specification. In general, it may be stated that the quality the purchased obtains will depend upon his own and his supplier's knowledge of the specific requirements, reinforced by such inspection requirements as he may impose. Of course, under the steel code, the imposition of special quality tests, as for example, the Ehn test as to grain size, or microscopic and macroscopic examinations, etc., necessitates the payment of certain standardized extras. It therefore behooves each steel user to identify and to establish in definite values of terms his particular engineering and metallurgical requirements, keeping in mind that a design which is poorly balanced or provides an inadequate factor of safety usually leads to the application of severe quality standards, with consequent purchasing penalties. Close co-operation with the steelmaker will promote a common understanding of the essential facts and help avoid charges for nnnecessary extras.

Too Many Steels Specified?

One frequently hears the criticism —"There are too many steels included in the S.A.E. specifications." Looking at the matter from the standpoint of ultimate economy that statement may be true. The Iron and Steel division is not oblivious to the fact that an automobile, a farm tractor, a diesel engine, a printing press, or even the latest model of streamlined locomotive and train can be built with but a small fraction of the number of steels covered by these specifications.

The S.A.E. Iron and Steel division, however, has no mandate to dictate to the steel user just what steel he shall use for his particular application, nor has it any mandate to limit the steel maker as to the compositions he shall make. Its job is to bring the various users and makers of each type or grade to an agreement upon a common chemical specification for that steel. It does require that a steel shall have attained a significant volume of production or be generally recognized as necessary before it is established as an S.A.E. steel. Thus, while these specifications provide 109 steels and alloys, the various compositions for a single steel have been reduced from as many as nine to one.

Limitation Would Be Unfair

Each user has his preferred steel compositions and each steel company has its particular group of steels upon which it specializes and endeavors to develop continually in the direction of improved quality. To attempt at this time to reduce substantially the varieties of steels in these specifications would not be desirable standardization. Its effect would be to stifle progress.

According to a prominent steel executive, this is an age of tailor-made steels. Such a state of affairs is not the ideal production schedule a steel maker ordinarily strives for. It is a condition bred by intensive competion arising from subnormal steel consumption and it is working to the advantage of the steel consumer from a quality standpoint. Competition is not now confined to the price field, it is a question of quality and service, hence we have the competition of one steel against another; of one alloy against another, and finally, and most important, of the research facilities of one steel company against the research facilities of its competitor. Out of all this we are destined to have more steels before we have less.

Basis for Simplification

Simplification, if it comes, will require the sympathetic interest and active co-operation of engineers and metallurgists in the steel consuming industries. There will be the need for them to supply precise information on the fundamental requirements of each type of steel as to service and manufacture, to supplement similarly unbiased data on economy of production and uniformity of quality to be provided by the steelmaker, more facts and fewer opinions from both groups concerning the advantages and disadvantages of the various strengthening elements, with a general willingness to compromise upon a few steels rather than an insistence upon many.

Convention Calendar

April 8-11—American Hardware Manufacturers association. Semiannual meeting at Miami-Biltmore hotel, Coral Gables, Fla. Charles F. Rockwell, 342 Madison avenue, New York, is secretary.

April 11-12—American Institute of Mining and Metallurgical Engineers. Meeting of open-hearth committee at Netherland-Plaza hotel, Cincinnati. L. F. Reinartz, works manager, American Rolling Mill Co., Middletown, O., is chairman.

April 12-13—Electric Metal Makers Guild. Annual meeting at Hotel Pritchard, Huntington, W. Va. Joseph A. Scott, 166 Tappan avenue, Belleville, N. J., is secretary.

April 15—American Society for Metals. Annual tri-chapter meeting of Cincinnati, Columbus and Dayton chapters at Engineers' club, Dayton, O. F. M. Reiter, Dayton Power & Light Co., Dayton, O., is secretary of the Dayton chapter.

April 22-23—American Zinc institute. Seventeenth annual meeting at Hotel Statler, St. Louis. R. M. Roosevelt, 60 East Forty-second street, New York, is president.

April 24-25—Association of Iron and Steel Electrical Engineers. Spring engineering conference at Ohio hotel, Youngstown, O. T. B. Little, Empire building, Pittsburgh, is acting managing director.

April 24-25—National Metal Trades association. Convention and exhibit in Cleveland. Harvey S. Flynn, 122 South Michigan avenue, Chicago, is secretary.

April 25—American Welding society. Annual meeting at Engineering Societies building, New York. M. M. Kelly, 33 West Thirty-ninth street, New York, is secretary.

April 29-May 1—Concrete Reinforcing Steel institute. Eleventh annual convention at Homestead hotel, Hot Springs, Va. R. W. Johnson, 201 North Wells street, Chicago, is secretary.

May 14-15—American Gear Manufacturers association. Annual meeting at Penn-Lincoln hotel, Wilkinsburg, Pa. J. C. McQuiston, Penn-Lincoln hotel, Wilkinsburg, Pa., is manager-secretary.

May 14-16—American Steel Warehouse association. Twenty-sixth annual convention at Edgewater Beach hotel, Chicago. Walter S. Doxsey, 442 Terminal Tower, Cleveland, is secretary.

May 20-23—National Associaton of Purchasing Agents. Annual convention and exhibit at Waldorf-Astoria hotel, New York. George A. Renard, 11 Park Place, New York, is secretary.

May 23—American Iron and Steel institute. Spring meeting at Hotel Commodore, New York. H. H. Cook, 350 Fifth avenue, New York, is secretary.

NEW EQUIPMENT

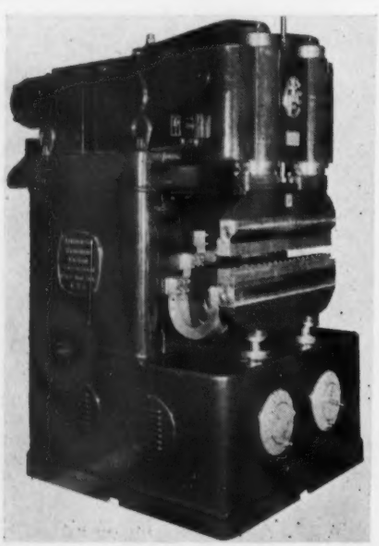
Projection Welder—

The American Electric Fusion Corp., 2610-20 Diversey avenue, Chicago, recently added to its line of projection welders a machine that makes twenty-one relief or projection welds distributed on a line 36 inches long. With this resistance welder, shown herewith, pressures up to 20,000 pounds are obtained by twin cam-actuated toggles driven by a 5 horsepower motor. The welding transformer is 600 kilovolt amperes at 60 cycles. Welding speed is variable between the rates of 30 to 60 strokes per minute.

The upper welding electrode is attached to two toggle-actuated plungers. Upper toggle pins are mounted in a lever which by reacting against a heavy spring, applies final or forging pressure. Force is applied to the middle toggle pin by a cam-actuated push rod which contains springs that allow it to shorten a definite amount and so apply light pressure while current is flowing.

Upper and lower electrodes consist of an assembly of three items. A heavy copper base casting supports blocks of hard drawn copper in which the actual electrode studs are inserted. The welding transformer consists of four hollow copper assemblies connected in parallel and clamped together at four corners on supporting posts, forming a one turn secondary circuit. The front posts form the secondary terminals.

Operating controls, located at the front of the machine, consist of start-stop push buttons for the motor and also a push button for inching the motor while adjusting the electrodes. The main welding contactor may be controlled by a push button while adusting primary welding pressures.

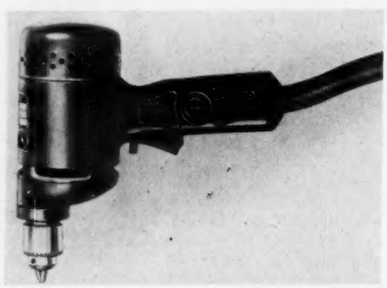


Projection welder built by American Electric Fusion Corp.

♦ ♦ ♦

Universal Electric Drill—

Chicago Pneumatic Tool Co., 6 East Forty-fourth street, New York, has brought out a universal electric drill which provides a production tool for drilling up to 3/16-inch capacity in airplane, auto body trim, metal furniture, steel shelving, sheet steel filing cabinets and similar light metal or wood work. Ventilation is furnished by a newly designed system that passes more air and exhaust against the work away from the operator's face. A screened intake excludes dirt and chips. Accessibility of the unit, shown herewith, is effected through instant exposure of all connection by simply removing the body cap and handle cover. Quick inspection of commutator and brushes while the motor is running is made possible removal of the body cap.

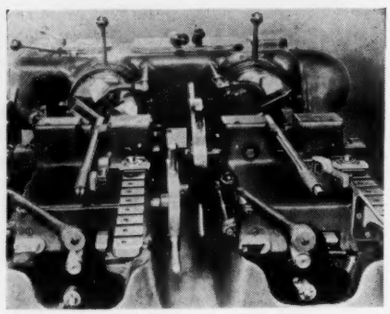


Production drill developed by Chicago Pneumatic Tool Co.

♦ ♦ ♦

Threading Machine Attachment—

Landis Machine Co. Inc., Waynesboro, Pa., recently placed on the market an attachment for use on its threading machines for threading reduced body staybolts with a continuous pitch thread on both ends. The attachment consists of a bracket attached to the carriage end cover. This bracket is provided with positions for holding the gage bracket as may be required for various lengths of staybolts. The gage bracket arm attached to the gage bracket carries the gage for timing the thread. All plain radial staybolts are threaded with a 12-pitch thread and the gage is made to fit. The gage arm being pivoted in the gage bracket permits it to be moved readily for clearing or engaging the thread. The attachment, illustrated on the right-hand side of the machine shows the gage swung back to permit removal or insertion of the staybolt in the vise, while the one on the left shows the gage about to be engaged in the thread.



Landis attachment for use on threading machines

Usual practice is to thread one end of the staybolt in the usual manner on one side of the machine without the use of the timing attachment. Set-up for the other end is made with a master staybolt which has been threaded properly with a continuous pitch thread on both ends. The master staybolt is inserted in the die head and the chasers closed to properly engage the thread. The timing attachment gage bracket is attached in its proper position for the length of the staybolt and the carriage set so that the timing attachment gage will properly engage the thread on the back end of the master staybolt. Leadscrew gears then are disconnected and the leadscrew turned by hand until it en-

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Lacquered and Coated Black Plate
Open Hearth Copper Bearing Terne
Plate 8 lb. to 40 lb. Coated
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and
Strip Steel Sheets
High Finish Sheets
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(Common and Special Finishes)
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gages the leadscrew nut, after which the leadscrew gears are again connected.

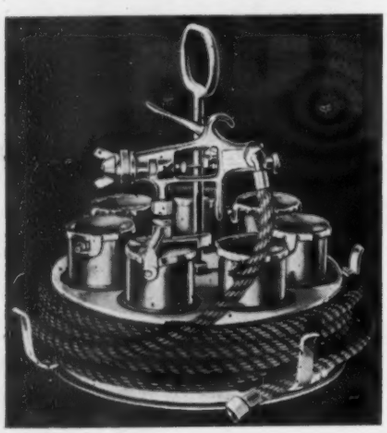
Since a 6-pitch leadscrew is used on the Landmaco threading machine and the staybolts always are threaded with a 12-pitch thread the leadscrew nut on succeeding threads can be engaged at any point on the screw and provide a proper lead. After the original set up has been made a thread of continuous lead on both ends of the staybolts is assured. Timing attachment gage is made in the form of an insert held in the gage arm. This permits making lateral adjustment of the gage if desired. It also permits the use of various gages of different thread forms, and of different pitches at a minimum of cost and effort. Usually only one timing attachment is required on a double head machine as its use is not required for threading the first end.

♦ ♦ ♦

Touch-up Outfit—

Binks Mfg. Co., 3106-50 Carroll avenue, Chicago, recently placed on the market a handy touch-up outfit which includes the newly perfected model 5 spray gun with its easily adjustable nozzle head. The equipment, shown herewith, is designed for use in manufacturing plants, refinishing rooms, paint shops for light spray work, shading and retouching finished products, etc.

Extra cups of aluminum or glass are furnished as desired and are provided with seal tight covers. This enables the operator to have a wide range of colors ready for use at all times. The outfit is furnished with 15 feet of light weight air hose with connections, 6 extra containers, and a light but durable tray for holding and carrying the entire equipment.

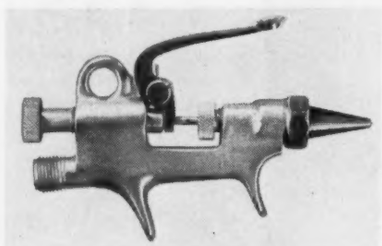


Binks touch-up outfit includes new model 5 spray gun

♦ ♦ ♦

Flow Gun—

DeVilbiss Co., Toledo, O., has developed a new type of flow gun in response to frequent requests for a gun or nozzle to flow stripes or ribbons. This unit, shown herewith, is designed especially for jobs such as striping automobile bumpers, and flowing sealing compounds, cements, and other plastic materials. Material is forced out of the nozzle directly onto the work. Since each nozzle must be designed for a particular job, it must be built according to the specifications of the user.



DeVilbiss flow gun available with either single or multiple nozzles

The gun may be made with either single or multiple nozzles which will flow any width of stripe up to one inch, and multiple nozzles may be designed to flow parallel stripes of either equal or unequal widths. Material flow with single nozzle guns may be controlled either by regulation of fluid pressure, or by adjustment of fluid needle travel, while multiple nozzle guns are provided with a small needle valve at each nozzle. The gun is small, light, and fits the hand comfortably. It may be operated either by thumb or index finger.

♦ ♦ ♦

Emergency Carbide Light—

National Carbide Sales Corp., Lincoln building, New York, recently placed on the market a new carbide police emergency light weighing only forty pounds when fully charged, and which burns for three hours, giving 8000 candle power. It has many applications in the municipal, aviation, railroad and construction fields.

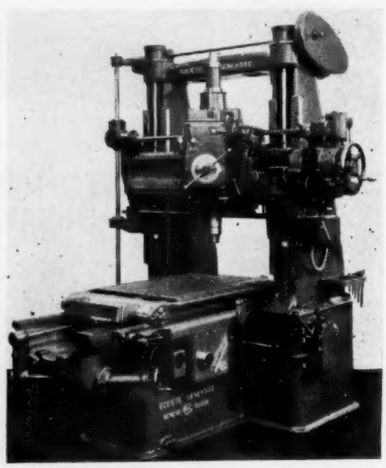
The reflector is mounted on a universal swing joint, so that the light may be shifted to any angle and may be easily folded down for carrying by a convenient handle above the carbide hopper. The unit is 3½ feet high when extended for use, and 28 inches when folded.

A 1¾ pound charge of carbide placed in the hopper is sufficient for over three hours. The light may be operated intermittently, as needed, without the waste of any of the charge. By throwing a lever the carbide is released a few grains at a time into the water tank below, and the rate of feed of the dry carbide is regulated automatically by the gas pressure. The light may be shut off by throwing the lever back to locked position. The tank is made of 18 gage sheet steel, hot-dipped in lead after the tank is welded. No spilling occurs if the light is turned over; it will go on operating when set upright.

♦ ♦ ♦

Milling and Jig Boring Unit—

Triplex Machine Tool Corp., New York, as American agents for Societe Genevoise D'Instruments de Physique, Geneva, Switzerland, is announcing a new milling and jig boring machine. This unit, shown herewith, is designed for direct production work as well as for the manufacture of jigs and fixtures. A measuring system unaffected by wear resulting from the heavy stresses due to milling work is embodied in the unit, so that the initial accuracy always is maintained.



Triplex announces new milling and jig boring machine

Considerable savings in setting time is assured by the hydraulic traverse of the table. This drive provides instantaneous and wide variations of speed between 0.2 and 80 inches per minute. A number of interesting features for this hy-

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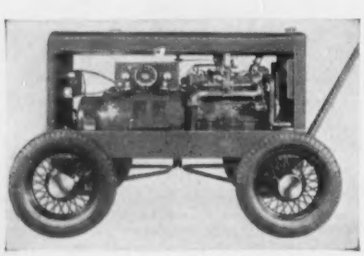
draulic feed have been developed, providing slow hand motion for fine setting purposes, the connecting of the hand locking of the table on the bed ways to a device releasing the hydraulic pressure, and proper adjustment of the table speed.

The spindle head of the new design is characterized by rigid construction, long feed (10 inches) operated either by power (six feeds down and six up), or by rapid and slow hand feed. Tools are inserted or extracted by means of a draw-in rod operated from the spindle nose, thus enabling the operator to change tools from his working position. Cross motion of the spindle head is controlled by a combination of rapid hand drive with an electrical power drive, the latter being used for milling purposes, while the former provides for quick traverse. All clamps are controlled from the operating side of the machine. The table is locked to the bed during boring.

♦ ♦ ♦

Gasoline Engine-Driven Arc Welder—

Hobart Bros. Co., Troy, O., has brought out a new model HF gasoline engine-drive "simplified" arc welder. Features of the new unit, shown herewith, include a more powerful engine with six or eight cylinders. Startix equipment with automatic choke and downdraft carburetor is another outstanding improvement. The device goes into operation as soon as the ignition switch is turned on and automatically cuts out the instant the engine starts. The automatic choke, thermostatically controlled, provides quick starting without danger of flooding, in all kinds of weather.



Hobart arc welder driven by six or eight-cylinder engine

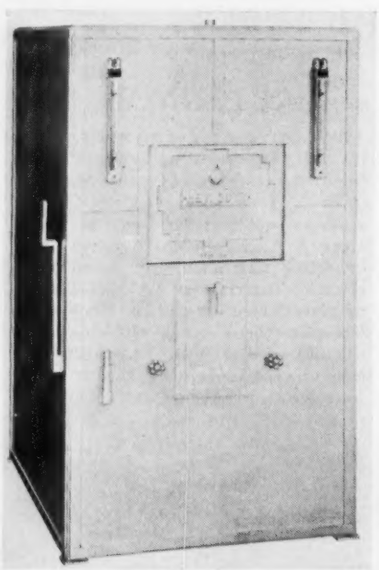
Calibrated ignition with vacuum controlled distributor insures maximum economy. A special generator supplies ample current to keep the storage battery charged, even when it is used for lights on the job. Air, oil and gas filters are standard equipment.

The 200 and 300-ampere sizes are equipped with 6-cylinder engine, while the 400-ampere size is the first arc welder to be equipped with a heavy-duty, 8-cylinder industrial engine. Variable speed adjustment makes it possible for the operator to select the most suitable and economical engine speed for each job, at any point from 1000 to 1800 revolutions per minute, full rated capacity being available at 1500 revolutions per minute. All models may be had in stationary form or portable, with shop type or yard type steel wheels—or mounted on an improved road trailer with wire wheels, pneumatic tires, radius rods and stabilizer.

♦ ♦ ♦

High Temperature Industrial Furnaces—

Hevi Duty Electric Co., Milwaukee, recently introduced into the metalworking and ceramic field a line of high temperature furnaces operating up to 2300 degrees Fahr. through the use of a new metallic resistor element that can be operated in either oxidizing or reducing atmospheres. The new new is claimed to have a resistance of 45 per cent greater than nickel chromium and a higher current carrying capacity which makes possible ample kilowatt capacity to handle the increased temperature requirements. No water cooling of the element terminals is required. The element can be readily welded.



High temperature furnace introduced by Hevi Duty Electric Co.

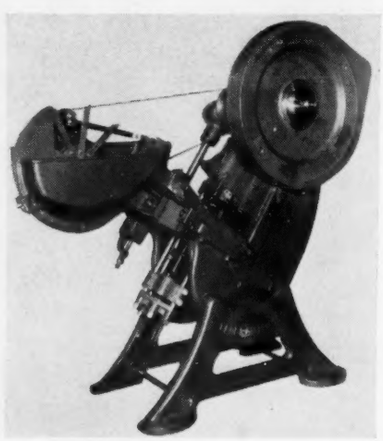
The furnace, illustrated herewith, is equipped with the Hayes "gas curtain" atmosphere control feature for providing either oxidizing or reducing atmospheres for the charge being treated. The protective atmosphere for the charge can be introduced direct into the furnace chamber without deteriorating the element.

The installed capacity is 21 kilowatt for operation on 230 volts. The furnace will heat from room temperature to 2300 degrees Fahr. in one hour, thirty-five minutes, and has a radiation loss when saturated at 2300 degrees Fahr. of 5.5 kilowatt hours per hour. After an overnight shut-down of 15 hours, the furnace drops to approximately 1000 degrees Fahr. and will reheat to 2300 degrees Fahr. in 55 minutes. The heating element design is adaptable to many kinds of furnace types to suit various process requirements. Principally among these are the forging of steel, reheating billets, brazing, annealing of stainless steel, and ceramic firing.

♦ ♦ ♦

Cap Screw and Bolt Trimming And Extruding Machine—

Federal Press Co., Elkhart, Ind., recently developed a No. 3 trimmer which is a high-speed machine for automatically trimming cap screws, bolts, etc., and also is used for extruding. The machine, illustrated herewith, will handle blanks from ½ to 2½ inches in length on all diameters ⅜-inch and smaller at the rate of 140 blanks per minute. Other sizes are also included in the line.



Federal high-speed unit trims cap screws, bolts automatically

Several unique features of con-

struction have been obtained by inclining this machine at thirty-five degrees from vertical. The natural position of the blanks coming down the raceway to the tools is at the same incline. This position is maintained in transferring the blanks into the tools resulting in short transfer movements and high speed.

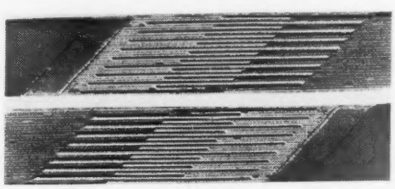
The blank transfer mechanism consists of two levers operated by direct roller contact with the cams. One lever operates the cradle for the blanks coming from the raceway, and the other lever carries the pick-up fingers which bring the blanks into the tools. The machine is built with taper gibs under the ram guides and when machine is once adjusted for alignment of tools, the bolts always will be trimmed on center.

A patented feature of this machine is the simple device for severing or shearing the chips from the screw head at the time that the punch and die have approached one another to crankshaft center position, with the chips pinched between punch and die. Pressure then is brought to bear on the end of the blank sufficient to separate the chips from the screw head.

♦ ♦ ♦

Vulcanized Splice for Transmission Belt—

Goodyear Tire & Rubber Co., Akron, O., recently announced a patented vulcanized splice for its "Compass Cord" transmission belting. By means of this new method



Belts made endless on drive by Goodyear vulcanized splice

these belts now can be made endless on the drive. The development enables users to obtain the belting in roll lot, non-endless length for use on belt drives where it formerly was necessary to dismantle the pulleys to install an endless belt.

As shown herewith, the ends of the "Compass" belt are joined together by dovetailing the load-carrying core of cords at the splice and by vulcanizing the spliced portion of the belt with a portable vulcanizer developed for this purpose.

♦ ♦ ♦

Lubrication Barrel Pump—

Alemite Corp., Chicago, has introduced a new high-pressure, air-operated barrel pump that converts any original 100-pound lubricant container into an efficient power gun for industrial lubrication. It develops a pressure thirty-three times the air pressure used and pumps 18 ounces of regular lubricant a minute, a de-

Alemite lubrication barrel pump for industrial use

livery more than sufficient to take care of several outlets at one time. This maroon, chrome plated barrel pump, shown herewith, is provided with either a 4-wheeled truck for portability or a base for stationary installation.

♦ ♦ ♦

Forging Rolls—

Ajax Mfg. Co., Cleveland, has placed on the market a new line of "wide adjustment" forging rolls to replace its earlier models. Rolls of the No. 0 or smallest size, are employed in the automotive field extensively for tapering the ends of spring leaves and pointing coil springs, while the larger No. 1 and 2 sizes, the latter shown herewith, are used for forging gear shift levers, rear axle drive shafts, and similar pieces, and for fullering and drawing operations on stock prior to drop or upset forging.

As the name implies, these rolls

are characterized by "wide adjustment" between the semi-cylindrical dies in which the forging impressions are sunk, making possible a greater number of die re-dressings and resulting in longer die life and decreased die maintenance. The top roll housings are readily adjustable vertically for proper forging thickness, and are, like the main housings, of steel casting with great cross-sectional area for extreme rigidity. These housings have provisions for taking up end play on the roll shafts, thereby preventing transverse mis-matching of dies. The roll shafts have integral die holders in which the die screws are so located as to make possible the use of half width dies. Gearing is completely housed and guarded to protect it from scale and other foreign matter.

Drive is from individual motor mounted on an adjustable hinged bracket above the gearing through multiple V-belts to the flywheel. The flywheel of the continuous operating machines has a friction-slip in the hub which acts as a safety to prevent damage in case of misplaced stock. The larger sizes can be equipped for stop motion operation with the Ajax air clutch and co-acting brake, the same as employed with marked success on air clutch forging machines.

No. 2 Ajax forging roll taper rolling rear axle drive shaft

Building a Sales Force for 1940

(*Concluded from Page 27*)

gation during the entire training period. In fact, the elusive bag of oats is kept dangling in front of his nose to spur him on to his first task.

The proverbial sheepskin is now tucked under the sales student's arm and he leaves for one of Republic's 23 district offices. This is an experience even old timers who have reached the top of the ladder wish to recount as a significant period in their business career. While in the mill the boys have been together on most of their work. Lacking practical experience, they find it difficult to get really serious about their new job. Their heads and notebooks are crammed full of data of all sorts. They have a long list of "don'ts" picked up everywhere from the top executive to the Italian floor sweeper in the mill. Now comes the time for individual effort. It is not until this time that judgment of the innermost qualities of the student which spell the value of the boy as a successful salesman or sales engineer can be attempted.

Immediately upon assignment to a district the student is taken in hand by the district sales manager. In many cases the first experience is on sales promotion work; in others, straight sales solicitation. In any event, each one is coached and guided carefully during his first months of field work.

Creative Work Gages Talent

Sales promotion affords an ideal opportunity to place the student on creative work. Many are prone to look at this type of selling as an indefinite or intangible method; as a matter of fact, many definite results can be discerned. It brings out in the shortest period of time fundamental indications that mark the student as a success or failure.

Selling an idea to a customer who specifies and does not actually purchase is considered by many as a far more difficult job than entering a deal when the stage is all set. It is not the intention to belittle the wisdom and intrigue of more experienced men. Many salesmen steer away from promotion work because they judge it to be of a preliminary nature and of no relation to an actual tonnage order. Many times, however, the salesman actually is afraid to tackle the promotion job. This point precipitates one of the main issues in steel merchandising of the future, as discussed at the beginning of this article; namely, that the future steel salesman must know more about his customers' problems. This holds true in the case of either the consumer or jobber type of customer.

As an example: Suppose a steel salesman is endeavoring to line up a new jobbing account in a particular territory. Some salesmen today will call on the jobber and talk about the weather, general business conditions the fact that he works for the greatest steel company in the world, and a few words about the resale; then will make inquiry about the inventory and will remark for the fifty-fifth time, "Well, Mr. Jones, I hope you decide to come over to us some of these days." Barring any major distasteful experience Mr. Jones has had with his present source, such a salesman would never get this account.

Studies Jobber's Problems

Suppose now this salesman through co-operation with the sales promotion man in his territory began to study this jobber's problems. Herein lies the value of promotion work with the owner, architect, engineer, general contractor and subcontractors, development of uses of steel for industrial maintenance, or the winning of orders from accounts not on the jobber's books. Further benefits may accrue from the fact many jobbers have been able to sell an industrial account items such as valves and fittings just because the door has been opened by a specialty alloy or steel.

Ultimate success will depend largely on the co-ordination of effort of the district office salesman and the promotion man with the assistance offered by the particular sales division involved and the sales promotion division at the general office.

The sales promotion man is called upon to make many important contacts; for instance, it falls upon him to convince a leading architect or engineer to specify a particular product for construction. It may be his province to discuss the proper application of steels with the purchasing agent, plant superintendent, or engineer, of a large industrial concern. He works closely with all jobbing outlets, bringing to their attention the possibility for sales.

Each week a summarized report is given the district sales manager with copies to all interested sales divisions at the general office. He follows up to completion all projects; he acts as a trainer of jobber and distribution salesmen. Sales meetings with jobbers and contractors are arranged in order to co-operate with sales campaigns of jobbers or distributors.

The student by this time has molded himself into a vital element of the district sales office organization. His work has been noticeable because it has been creative. From here the sales promotion man moves forward, being awarded more responsible duties, either in the district or general office.

Redesigning for Special Steels

All this work is under close observation and co-operation of the sales promotion division. Each time a new application for a product is developed, immediate survey is made of all other existing outlets. Manufacturers are encouraged to redesign or revamp their products by using a special steel, giving increased utility and sales appeal.

In an organization such as Republic Steel Corp., each sales division is stressing every effort in favor of its individual products. Naturally, each division is asking for a lion's share of the time of district office manager and salesmen. Hence, a co-ordinating influence, in addition to the general office sales executives, becomes paramount. It is in such a position that the sales promotion division is serving a needed function.

A general educational program is underway for the entire sales organization. Series of conferences are held regularly in each district office for the entire district sales group. Divisional sales managers from the general office address these groups at stated intervals. Groups of salesmen have inspected the mills so that complete knowledge of mill improvements and details of manufacture could be received.

By constant research and this careful training of personnel, Republic Steel is laying its plans for greater achievements in years to come.

Trade Publications

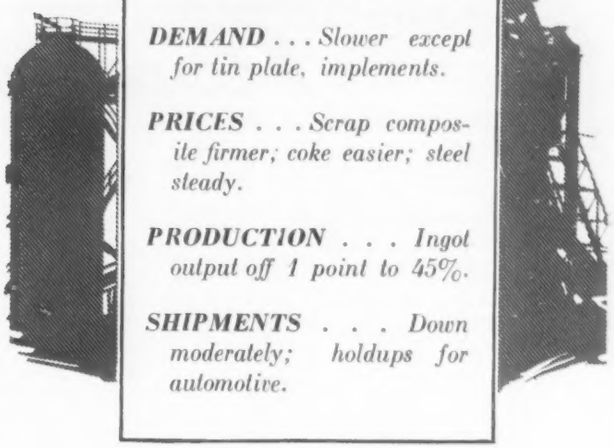
LEATHER PACKINGS — Michigan Leather Packing Co., 752 Fourteenth avenue, Detroit, has brought out a new bulletin, No. 701, on its mechanical leather packings and oil seals. The bulletin is of particular interest because it includes illustrations and a description of an unusual and exacting test made on one of the various types and designs of mechanical leather packings which the company produces.

ARC WELDER—A bulletin by the USL Battery Corp., Niagara Falls, N. Y., describes its 300-ampere protected arc welder, driven by belt or direct connected to six-cylinder gas engine. Illustrations and specifications are included and oscilligrams show its performance.

PRECISION BORING—Cimatool Co., Cincinnati, in a current bulletin presents descriptive material on precision boring equipment, especially its heavy duty double end precision boring machine. The machine was introduced about 18 months ago.

Steel Rate Off Moderately; Market Quieter

Automotive Shipments Slipping; Pig Iron Demand Strong



MARKET IN TABLOID

DEMAND *. . . Slower except for tin plate, implements.*

PRICES *. . . Scrap composite firmer; coke easier; steel steady.*

PRODUCTION *. . . Ingot output off 1 point to 45%.*

SHIPMENTS *. . . Down moderately; holdups for automotive.*

MODERATE reduction in steel consumption by the automobile industry, sustained demand from farm implement and tin-plate container manufacturers, a slight improvement in structural and railroad buying —these represent the outlook afforded by present iron and steel market conditions.

The view at this time is not so encouraging as it was at the outset of the second quarter last year, although miscellaneous requirements still are an uncertain factor and with those industries which recently have lagged may turn the present trend of steel production.

In completing the first quarter, steelworks operations last week dropped 1 more point to 45 per cent, down 10 from the peak reached in early February. Automobile assemblies rose to approximately 103,000, highest for any week since September, 1929, raising the output for three months to more than 1,000,000 cars, best since the second quarter of 1930.

Nevertheless, it became more apparent that the automobile industry is coasting along on parts and materials already acquired, as specifications were in reduced volume, holdup orders were issued by some of the leading manufacturers, curtailing sheet and strip mill operations.

Due chiefly to slower automotive commitments, steel ingot production at Youngstown last week dropped 8 points to 52 per cent, Cleveland 3 to 67, Chicago 1 to 46. Pittsburgh advanced 3 to 38, responding to a 5-point gain to 90 per cent in tin plate mills, and anticipating rail mill schedules. Pittsburgh steel pipe production, on the other hand, dropped 10 points to 25 per cent. Steel ingot production at Wheeling advanced 3 points to 95 per cent; Buffalo was down 2 to 35, and other districts were unchanged.

Structural shape backlogs on fabricators' books today are only two-thirds the tonnage at this time last year. Awards last week dropped to 9140 tons. The Boston army base will buy shortly 8000 tons for repairs. Orders for 120,000 government cots call for 2700 tons of miscellaneous steel. Platemakers are interested in the naval appropriation bill to be introduced this week for 12 destroyers, six submarines, three heavy and two light cruisers and an aircraft carrier, which may develop a large steel tonnage. Gulf Refining Co., New York, has opened bids for two tankers, requiring 8000 tons of plates, shapes and bars. New York city has awarded 5000 tons of cast pipe.

Pig iron shipments in the Great Lakes district in March were the largest in nine months and give indications of further gains; coke shipments were the highest in five years. The General Steel Castings Corp., Granite City, Ill., is inquiring for 10,000 tons of pig iron. Though scrap prices continued weak at Chicago and Detroit, Pittsburgh was firmer, and the decline in STEEL's scrap composite, 5 cents to $10.41, was the lightest of six consecutive weekly reductions. Connellsville beehive coke is easier, due to heavy stocks.

Iron and steel exports in February—228,537 gross tons—were 13 per cent less than in January, with a shrinkage in scrap orders. Imports, 28,905 tons, were up 27 per cent. Imports of pig iron from the Netherlands were resumed, 7992 tons being shipped to this country.

STEEL's London correspondent cables Great Britain's advance in iron and steel import duties from 33⅓ to 50 per cent is seriously affecting French and Belgian trade. Completion of Britain's trade pact with Italy raises hope for better exports to that country.

STEEL's iron and steel price composite is down 3 cents to $32.30, while the finished steel index holds at $54.

COMPOSITE MARKET AVERAGES

	March 30	March 23	March 16	One Month Ago Feb., 1935	Three Months Ago Dec., 1934	One Year Ago March, 1934	Five Years Ago March, 1930
Iron and Steel	$32.30	$32.33	$32.38	$32.54	$32.39	$31.38	$34.79
Finished Steel	54.00	54.00	54.00	54.00	54.00	51.10	54.88
Steelworks Scrap	10.41	10.46	10.71	11.66	11.02	12.30	14.52

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	March 30, 1935	Feb., 1935	Dec., 1934	Mar., 1934
Steel bars, Pittsburgh	1.80c	1.80c	1.80c	1.75c
Steel bars, Chicago	1.85	1.85	1.85	1.80
Steel bars, Philadelphia	2.09	2.09	2.09	2.04
Iron bars, Terre Haute, Ind.	1.75	1.75	1.75	1.60
Shapes, Pittsburgh	1.80	1.80	1.80	1.70
Shapes, Philadelphia	2.00½	2.00½	2.00½	1.90½
Shapes, Chicago	1.85	1.85	1.85	1.75
Tank plates, Pittsburgh	1.80	1.80	1.80	1.70
Tank plates, Philadelphia	1.98½	1.98½	1.98½	1.88½
Tank plates, Chicago	1.85	1.85	1.85	1.75
Sheets, No. 10, hot rolled, Pitts.	1.85	1.85	1.85	1.75
Sheets, No. 24, hot ann., Pitts.	2.40	2.40	2.40	2.25
Sheets, No. 24, galvan., Pitts.	3.10	3.10	3.10	2.85
Sheets, No. 10, hot rolled, Gary.	1.95	1.95	1.95	1.85
Sheets, No. 24, hot anneal., Gary	2.55	2.55	2.55	2.35
Sheets, No. 24, galvan., Gary	3.20	3.20	3.20	2.95
Plain wire, Pittsburgh	2.30	2.30	2.30	2.20
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25
Wire nails, Pittsburgh	2.60	2.60	2.60	2.35

Semifinished Material

Sheet bars, open-hearth, Youngs.	$28.00	$28.00	$28.00	$26.00
Sheet bars, open-hearth, Pitts.	28.00	28.00	28.00	26.00
Billets, open-hearth, Pittsburgh	27.00	27.00	27.00	26.00
Wire rods, Pittsburgh	38.00	38.00	38.00	36.00

Pig Iron

	March 30, 1935	Feb., 1935	Dec., 1934	Mar., 1934
Bessemer, del. Pittsburgh	$19.76	$19.76	$19.76	$19.26
Basic, Valley	18.00	18.00	18.00	17.00
Basic, eastern, del. eastern Pa.	19.76	19.76	19.76	18.76
No. 2, foundry, del. Pittsburgh.	19.26	19.26	19.26	18.76
No. 2, foundry, Chicago	18.50	18.50	18.50	17.50
Southern No. 2, Birmingham	14.50	14.50	14.50	13.50
No. 2X eastern, del. Philadelphia	20.63	20.63	20.63	19.63
Malleable, Valley	18.50	18.50	18.50	17.50
Malleable, Chicago	18.50	18.50	18.50	17.50
Lake Superior charcoal, del. Chi.	24.04	24.04	24.04	23.54
Ferromanganese, del. Pittsburgh.	89.79	89.79	89.79	90.24
Gray forge, del. Pittsburgh	18.63	18.63	18.63	18.38

Scrap

Heavy melting steel, Pittsburgh	$12.25	$13.25	$12.95	$14.35
Heavy melt. steel, No. 2, east. Pa.	8.75	10.12	9.30	9.70
Heavy melting steel, Chicago	10.25	11.65	10.55	12.00
Rails for rolling, Chicago	11.25	12.55	11.65	12.75
Railroad steel specialties, Chicago	11.25	12.50	11.90	13.00

Coke

Connellsville, furnace, ovens	$3.60	$ 3.60	$3.60	$3.35
Connellsville, foundry, ovens	4.60	4.60	4.60	4.25
Chicago, by-product foundry, del.	9.25	9.25	9.25	9.25

Steel, Iron, Raw Material, Fuel and Metals Prices

Prices are code levels filed with American Iron and Steel Institute, 350 Fifth avenue, New York. Except when otherwise designated, prices are base, f.o.b. cars. Asterisk denotes price change this week.

Sheet Steel

Hot Rolled No. 10, 24-48 in.

Pittsburgh	1.85c
Gary	1.95c
Chicago, delivered	1.98c
New York, del.	2.18c
Philadelphia, del.	2.14c
Birmingham	2.00c
St. Louis, del.	2.17c
Pacific ports, f.o.b. cars, dock	2.40c

Hot Rolled Annealed No. 24

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, delivered	2.60c
New York, del.	2.73c
Philadelphia, del.	2.69c
Birmingham	2.55c
St. Louis, del.	2.72c
Pacific ports, f.o.b. cars, dock	3.05c

Galvanized No. 24

Pittsburgh	3.10c
Gary	3.20c
Chicago, delivered	3.23c
Philadelphia, del.	3.39c
New York, del.	3.43c
Birmingham	3.25c
St. Louis, del.	3.42c
Pacific ports, f.o.b. cars, dock	3.70c

Tin Mill Black No. 28

Pittsburgh	2.75c
Gary	2.85c
St. Louis, delivered	3.07c

Cold Rolled No. 10

Pittsburgh	2.50c
Gary	2.60c
Detroit, delivered	2.70c
Philadelphia, del.	2.79c
New York, del.	2.83c
Pacific ports, f.o.b. cars, dock	3.10c

Cold Rolled No. 20

Pittsburgh	2.95c
Gary	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.24c
New York, del.	3.28c

Enameling Sheets

Pittsburgh, No. 10	2.50c
Pittsburgh, No. 20	3.10c

Tin and Terne Plate

Gary base, 10 cents higher.

Tin plate, coke base con. (box) Pitts.	$5.25
Do., waste-waste	2.75c
Do., strips	2.50c
Long ternes, No. 24 unassorted, Pitts.	3.40c
Do., Gary	3.50c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No 304
Bars	23.00	24.00
Plates	26.00	28.00
Sheets	33.00	35.00
Hot strip	20.75	22.75
Cold strip	27.00	29.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	17.00	18.50	21.00	26.00
Plates	20.00	21.50	24.00	29.00
Sheets	25.00	28.00	31.00	35.00
Hot strip	15.75	16.75	21.75	26.75
Cold strip	20.50	22.00	27.00	35.00

Steel Plates

Pittsburgh	1.80c
New York, del.	2.08c
Philadelphia, del.	1.98½c
Boston, delivered	2.20c
Buffalo, delivered	2.03½c
Chicago or Gary	1.85c
Cleveland, del.	1.98½c
Birmingham	1.95c
Coatesville, base	1.90c
Sparrows Pt., base	1.90c
Pacific ports, f.o.b. cars, dock	2.35c
St. Louis, delivered	2.07c

Structural Shapes

Pittsburgh	1.80c
Philadelphia, del.	2.00½c
New York, del.	2.05½c
Boston, delivered	2.18½c
Bethlehem	1.90c
Chicago	1.85c
Cleveland, del.	1.98½c
Buffalo	1.90c
Gulf Ports	2.20c
Birmingham	1.95c
Pacific ports, f.o.b. cars, dock	2.35c

Bars

Soft Steel

Pittsburgh	1.80c
Chicago or Gary	1.85c
Duluth	1.95c
Birmingham	1.95c
Cleveland	1.85c
Buffalo	1.90c
Detroit, delivered	1.95c
Pacific ports, f.o.b. cars, dock	2.35c
Philadelphia, del.	2.09c
Boston, delivered	2.20c
New York, del.	2.13c
Pitts., forg. qual.	1.95c-2.05c

Rail Steel

To Manufacturing Trade

Pittsburgh	1.70c
Chicago or Gary	1.75c
Moline, Ill.	1.75c
Cleveland	1.75c
Buffalo	1.80c

Iron

Troy, N. Y.	1.70c
Terre Haute, Ind.	1.75c
Chicago	1.80c
Philadelphia	1.89c
Pittsburgh, refined	2.75-7.50c

Reinforcing

New billet, straight lengths, quoted by distributors.

Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young.	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. cars dock	2.45c
Philadelphia, del.	2.34c

Rail Steel

Straight lengths quoted by distributors

Pittsburgh	1.90c
Chicago, Buffalo, Cleveland, Birm., Young.	1.95c
Gulf ports	2.30c

Wire Products

(Prices apply to straight or mixed carloads; pool cars, or less, 15c up. 10% dis. on nail extras on stright or mixed carloads to one consignee.)

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.60
Cement coated nails	2.60
Galvanized nails, 15 gage and coarser	4.60c
do., 16 gage and finer	5.10c

(Per pound)

Polished staples	3.30c
Galvanized fence staples	3.55c
Barbed wire, galv.	3.00c
Annealed fence wire	2.45c
Galvanized fence wire	2.80c
Woven wire fencing (base column, c.l.)	$63.00
Plain wire, 6-9 gage to mfg. trade	2.30c

Anderson, Ind., (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire, Pittsburgh or Cleveland	2.90c

Do., Chicago up $1, Worcester, $2.

Cold-Finished Carbon Bars and Shafting

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	2.10c
20,000 to 59,999 lbs.	2.05c
60,000 to 99,999 lbs.	2.00c
100,000 lbs. and over	1.97½c

Gary, Ind., Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Alloy Steel Bars (Hot)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	2.45c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.	0.50
4600 0.20 to 0.30 Mo. 1.25-1.75 Ni.	1.05
5100 0.80-1.10 Cr.	0.45
5100 Cr. spring	base
6100 bars	1.20
6100 spring	0.70
Cr., Ni., Van.	1.50
Carbon Van.	0.95

9250.....Carbon base plus extras

Piling

Pittsburgh	2.15c
Chicago, Buffalo	2.25c

Strip and Hoops

Hot strip to 23⅛-in. Pittsburgh	1.85c
Chicago, base	1.95c
Birmingham base	2.00c
Detroit, delivered	2.05c
Phila., delivered	2.14c
New York, del.	2.18c
Cooperage hoop, Pittsburgh	1.95c
Chicago	2.05c
Cold-rolled strip, Pitts., Cleve.	2.60c
Worcester, Mass.	2.80c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts. 24-45 lbs.	$26.00
50-60 lbs.	$23.00
70-75 lbs.	$20.00
80-85 lbs.	$24.00
100 lbs.	$25.00
Light Rails, billet qual. Pitts., Chi.	$35.00
Do., reroll. qual.	34.00
Angle bars, mills	2.55c
Spikes, R. R. base	2.40c
Track bolts, base	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs. up $8; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots, Dec. 1, 1932, lists, 10% extra for less full containers.

Carriage Bolts

All sizes, cut thread	70-10-5 off
Rolled thread, ½ x 6, smaller	70-10-5 off

Machine Bolts

All sizes cut thread lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts stud bolts	70-10-5 off
Tire bolts	60-5 off
Stove bolts, 75 off in pkgs.; 83 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.	
Rolled thread machine, ½ x 6, smaller	70-10-5 off
Step bolts	70-5 off
Elevator bolts	70-5 off

Nuts

S.A.E. semifinished hex.; ½ to ⅞-inch	70-10-5 off
Do., ½ to 1-inch	70-10-5 off
Do., over 1-inch	70-5 off

Hexagon Cap Screws

Milled	85 off
Upset, 1-in., smaller	85 off

Square Head Set Screws

Upset, 1-in., smaller	70-10 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland	2.90c
Struc., c. l., Chicago	3.00c
⅞-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila., to jobbers & large nut, bolt mfrs.	$6.25 off

Cut Nails

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more no discount on size extras	$3.05
Do. under 5 kegs; no discount on size extras	$3.20

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago delivered 2½ points less. Wrought pipe, Pittsburgh base.

Butt Weld

Steel

In.	Blk.	Gal.
¼ and ⅜	53½	35
½	58½	47
¾	62	52
1—3	64	55

Iron

½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

Lap Weld

Steel

2	60	51
2½—3	63	54
3½—6	65	56
7 and 8	64	54
9 and 10	63½	53½

Iron

2	37	22½
2½—3½	38	25
4—8	40	28½

Line Pipe

Steel

½, butt weld	57½
⅛-inch, butt weld	50½
¼—⅜, butt weld	52½
¾, butt weld	61
1—3, butt weld	63
2-inch, lap weld	59
2½—3, lap weld	62
3½—6, lap weld	64
7—8, lap weld	63

Iron

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe lists, 8—12-inch, no extra.

Boiler Tubes

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¼—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 200 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 lbs., 2 points under base.

Seamless Boiler Tubes

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$38.00-39.00
4-in., Birmingham	41.00-42.00
4-in., Chicago	49.00-50.00
6 to 24-in., Chicago	46.00-47.00
6-in. & over, east fdy.	42.00
Do., 4-in.	45.00

Class A pipe $3 over Class B. Stnd. fitgs., Birm. base...$100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., and Youngstown	$27.00
Philadelphia	32.30
Duluth	31.00
Forging, Pitts., Chi. and Buffalo	32.00
Forging, Duluth	36.00

Sheet Bars

Pitts., Cleve., Young., Chi., Buff., Canton, Sparrows Pt.	28.00

Slabs

Pitts., Cleve., Young.	27.00

Wire Rods

(Common; combination up $2)

Pitts., Cleveland	38.00
Chicago	39.00
Worcester, Mass.	40.00

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Point	1.70c

Coke

Price Per Net Ton

Beehive Ovens

*Connellsville, fur.	$3.60
Connellsville, fdry.	4.60
Connel. prem. fdry.	5.10
New River fdry.	6.00
Wise county fdry.	4.45- 5.25
Wise county fur.	4.00- 4.50

By-Product Foundry

Newark, N. J., del.	9.20- 9.65
Chi., ov., outside del.	8.50
Chicago, del.	9.25
New England, del.	11.00
St. Louis, del.	9.25
Birmingham, ovens	6.00
Indianapolis, del.	8.75
Cincinnati, del.	9.30
Cleveland, del.	9.25
Buffalo, ovens	7.50- 8.00
Detroit ov., out. del.	8.50
Philadelphia, del.	9.00

Coke By-Products

Per gallon, producers' plants.

Tank lots	Spot
Pure and 90% benzol	15.00c
Toluol	30.00c
Solvent naphtha	26.00c
Commercial xylol	26.00c

Per lb. f.o.b. New York.

Phenol (200 lb. drums)	16.30c
Do. (100 lbs.)	17.30c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls.	5.00c

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.20

†Western prices, ½-cent up.

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$19.50	$20.00	$19.00	$20.50
Birdsboro, Po.	19.50	20.00	19.00	20.50
Birmingham, Ala., southern del...	14.50	14.50	13.50	19.00
Buffalo	18.50	19.00	17.50	19.50
Chicago	18.50	18.50	18.00	19.00
Cleveland	18.50	18.50	18.00	19.00
Detroit	18.50	18.50	18.00	19.00
Duluth	19.00	19.00	.....	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Everett, Mass.	19.50	20.00	19.00	20.50
Granite City, Ill.	18.50	18.50	18.00	.....
Hamilton, O.	18.50	18.50	18.00	19.00
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Sparrows Point, Md.	19.50	.....	19.00	.....
Swedeland, Pa.	19.50	20.00	19.00	20.50
Toledo, O.	18.50	18.50	18.00	19.00
Youngstown, O.	18.50	18.50	18.00	19.00
Delivered from Basing Points:				
Akron, O., from Cleveland	19.76	19.76	19.26	20.26
Baltimore from Birmingham	20.02	.....	19.90	.....
Boston from Birmingham	19.62	.....	19.50	.....
Boston from Everett, Mass.	20.00	20.50	19.50	21.00
Boston from Buffalo	20.00	20.50	19.50	21.00
Brooklyn, N. Y., from Bethlehem	21.77	22.27	.....	.....
Brooklyn, N. Y., from Bmgham..	21.30	.....	.....	.....
Canton, O., from Cleveland	19.76	19.76	19.26	20.26
Chicago from Birmingham	†18.72	.....	18.60	.....
Cincinnati from Hamilton, O.....	19.51	19.51	19.01	.....
Cincinnati from Birmingham.....	19.13	.....	19.01	.....
Cleveland from Birmingham.....	18.62	.....	18.50	.....
Indianapolis from Hamilton, O...	20.77	20.77	20.27	21.27
Mansfield, O., from Toledo, O.....	20.26	20.26	19.76	20.76
Milwaukee from Chicago.....	19.50	19.50	19.00	20.00
Muskegon, Mich., from Chicago, Toledo or Detroit	21.40	21.40	20.90	21.90
Newark, N. J., from Birmingham	20.51	.....	.....	.....
Newark, N. J., from Bethlehem..	20.89	21.39	.....	.....
Philadelphia from Birmingham..	19.88	.....	19.76	.....
Philadelphia from Swedeland, Pa.	20.26	20.76	19.76	.....
Pittsburgh district from Neville Island	Neville base plus 63c, 76c and $1.13 switching charges			
Saginaw, Mich., from Detroit.....	20.60	20.60	20.10	21.10

Delivered from Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis from Granite City, Ill....	19.00	19.00	18.50	.....
St. Louis from Birmingham.....	18.62	.....	18.50	.....
St. Paul from Duluth	20.94	20.94	.....	21.44

†Over 0.70 phos.

Low Phos

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $23.50. Phila. base, standard and copper bearing, $24.63.

Gray Forge		Charcoal	
Valley furnace	18.00	Lake Superior fur.	21.00
Pitts. dist. fur.	18.00	Do., del. Chicago	24.04

Silvery†

Jackson County, O., base; 6% $22.75; 7—$23.75; 8—$24.75; 9—$25.70; 10—$26.75; 11—$27.75. Buffalo base prices, up $1.25.

Bessemer Ferrosilicon†

Jackson County, O., base; 10%—$27.75; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25. Buffalo base prices $1.25 higher.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Refractories

Per 1000 f.o.b. Works

Fire Clay Brick

First Quality.

Pa., Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	45.00

Second Quality

Pa., Ill., Ky., Md., Mo., Ga., Ala.	40.00

Ohio

First quality	$40.00-45.00
Intermediary	37.00
Second quality	28.00

Malleable Bung Brick

All bases	50.00

Silica Brick

Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	52.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags).... $45.00

Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags).. 40.00

Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk).. 22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$45.00
Chemically bonded chrome brick	42.50
Magnesite brick	65.00
Chemically bonded magnesite brick	55.00

Fluorspar, 85-5

Washed gravel, duty paid, tide. net ton	$18.75-19.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$13.00-14.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
Do., Balti. base	85.00
Do., del. Pittsburgh	89.79
Spiegeleisen, 19-20% dom. Palmerton, Pa., spot†	26.00
Do., New Orleans	26.00
Ferrosilicon, 50% freight all., cl.	77.50
Do., less carload	85.00
Do., 75 per cent .. Spot, $5 a ton higher.	126-130.00
Silicomang., 2½ carb. 2% carbon, 95.00; 1%,	90.00 105.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	10.00
Ferrotungsten, stand., lb. cont. del.	1.35- 1.45
Ferrovanadium, 35 to 40% lb., cont., on analysis	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17.-19% Rockdale, Tenn., basis, 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	65.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.89

†Carloads. Quan. diff. apply.

Nonferrous Prices

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: New York Spot	Straits Tin: New York Futures	Lead: New York	Lead: East St. L.	Zinc: St. L.	Aluminum 99%	Antimony: Chinese Spot, N. Y.	Nickel: Cathodes
Mar. 23	9.00	9.12½	7.60	46.20	45.90	3.60	3.45	3.90	*19.00	14.50	35.00
Mar. 25	9.00	9.12½	7.60	47.25	46.85	3.60	3.45	3.90	*19.00	14.50	35.00
Mar. 26	9.00	9.12½	7.60	47.40	47.00	3.60	3.45	3.90	*19.00	14.50	35.00
Mar. 27	9.00	9.12½	7.60	47.50	47.15	3.60	3.45	3.90	*19.00	14.50	35.00
Mar. 28	9.00	9.12½	7.60	47.60	47.20	3.65	3.50	3.90	*19.00	14.50	35.00
Mar. 29	9.00	9.12½	7.60	47.55	47.15	3.65	3.50	3.90	*19.00	14.50	35.00

*Nominal range 19.00 to 21.00c.

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper, brass products based on 9.00c Conn. copper.

Sheets	
Yellow brass (high)	14.25
Copper, hot rolled	16.00
Lead, cut, to jobbers	7.25
Zinc, 100-lb. base	9.50
Tubes and Pipes	
High yellow brass	16.00
Seamless copper	16.25
Rods	
High yellow brass	12.75
Copper, hot rolled	13.25
Anodes	
Copper, untrimmed	13.75
Wire	
Yellow brass (high)	14.75

OLD METALS

Deal. buying prices, cents lb.

No. 1 Composition Red Brass	
*New York	4.37½-4.62½
Cleveland	5.00- 5.25
*Chicago	4.50- 4.75
St. Louis	4.75- 5.00
Heavy Copper and Wire	
*New York	5.87½-6.12½
*Chicago, No. 1	5.62½-5.87½
Cleveland	5.50- 5.75
*St. Louis	5.50- 5.62½
Composition Brass Borings	
*New York	3.87½-4.12½
Light Copper	
*New York	4.62½-4.87½
*Chicago	4.37½-4.62½
Cleveland	4.75- 5.00
*St. Louis	5.00- 5.12½
Light Brass	
Chicago	2.12½-2.37½
*Cleveland	2.25- 2.50
Lead	
New York	2.70- 2.80
Cleveland	2.50- 2.75
Chicago	2.50- 2.75
*St. Louis	2.75- 3.00
Zinc	
New York	1.87½-2.12½
*Cleveland	1.75- 2.12½
*St. Louis	1.75- 2.00
Aluminum	
Borings, Cleveland	7.25- 8.00
Mixed, cast, Clev.	11.50-12.00
Mixed, cast, St. L.	12.75-13.00
*Clips, soft, Clev.	13.25-13.50

SECONDARY METALS

Brass ingot, 85-5-5-5	8.25
*Stand. No. 12 Alum.	15.75-17.00

Iron and Steel Scrap Prices

Corrected to Friday night Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	9.00- 9.50
Boston, dock, expt.	8.50- 8.75
Boston, domestic	7.00- 7.25
Buffalo, No. 1	10.50-11.00
Buffalo, No. 2	9.00- 9.25
Chicago, No. 1	10.00-10.25
Cleveland, No. 1	9.50-10.00
Cleveland, No. 2	9.00- 9.50
Detroit, No. 1	7.50- 8.00
Detroit, No. 2	6.50- 7.00
Eastern Pa., No. 1	10.00-10.50
Eastern Pa., No. 2	8.50- 9.00
Federal, Ill.	7.50- 8.00
Granite City, R. R.	8.25- 8.75
Granite City, No. 2	7.25- 7.75
N. Y., deal. No. 2	7.50
N. Y., deal. barge	9.00
Pittsburgh, No. 1	12.00-12.50
Pittsburgh, No. 2	10.50-11.00
St. Louis	7.25- 7.75
Valleys, No. 1	12.00-12.50

COMPRESSED SHEETS

Buffalo, dealers	9.00- 9.25
Chicago, factory	9.00- 9.50
Chicago, dealer	8.00- 8.50
Cleveland	9.00- 9.50
Detroit	7.75- 8.25
E. Pa., new mat.	9.50-10.00
Pittsburgh	11.75-12.25
St. Louis	7.00- 7.25
Valleys	11.75-12.00

BUNDLED SHEETS

Buffalo	7.50- 8.00
Cincinnati, del.	6.00- 6.50
Cleveland	6.50- 7.00
Pittsburgh	10.50-11.00
St. Louis	4.50- 5.00

SHEET CLIPPINGS, LOOSE

Chicago	6.00- 6.50
Cincinnati	5.50- 6.00
Detroit	5.00- 5.50
St. Louis	4.00- 4.50

STEEL RAILS, SHORT

Birmingham	12.00-12.50
Buffalo	12.00-12.50
Chicago (3 ft.)	12.00-12.50
Chicago (2 ft.)	13.00-13.50
Cincinnati, del.	11.50-12.00
Detroit	10.00-10.50
Pitts., open-hearth, 3 ft. and less	14.00-14.50
St. Louis, 2 ft.& less	12.00-12.50

STEEL RAILS, SCRAP

Boston	7.00- 7.25
Chicago	10.00-10.25
Pittsburgh	12.50-13.00
St. Louis	9.00- 9.50

STOVE PLATE

Birmingham	6.00- 6.50
Boston, dealers	3.75- 4.00
Buffalo	9.00- 9.50
Chicago, net	6.50- 7.00
Cincinnati, dealers	5.50- 6.00
Detroit, net	5.75- 6.25
Eastern Pa.	8.50- 9.00
N. Y., deal. fdry.	6.00
St. Louis	5.50- 6.00

COUPLERS, SPRINGS

Buffalo	12.75-13.25
Chicago, springs	11.50-12.00
Eastern Pa.	13.50-14.00
Pittsburgh	14.00-14.50
St. Louis	9.00- 9.50

ANGLE BARS—STEEL

Chicago	11.50-12.00
St. Louis	10.00-10.50

RAILROAD SPECIALTIES

Chicago	11.00-11.50

LOW PHOSPHORUS

Buffalo, billets and bloom crops	12.00-12.50
Cleveland, billet, bloom crops	14.00-14.50
Eastern Pa., crops	13.00-14.00
Pittsburgh, billet, bloom crops	15.00-15.50
Pittsburgh, sheet bar crops	13.50-14.00
Pittsburgh, plate	13.00-13.50

FROGS, SWITCHES

Chicago	10.00-10.50
St. Louis, cut	9.00- 9.50

SHOVELING STEEL

Chicago	10.00-10.25
Federal, Ill.	7.50- 8.00
Granite City, Ill.	7.25- 7.75

RAILROAD WROUGHT

Birmingham	7.50- 8.00
Boston, dealers	6.00- 6.50
Buffalo, No. 1	8.00- 8.50
Buffalo, No. 2	10.50-11.00
Chicago, No. 1, net	9.00- 9.50
Chicago, No. 2	10.00-10.25
Cincinnati, No. 2	8.00- 8.50
Eastern Pa.	10.50-11.00
N. Y., No. 1, deal.	7.50- 8.00
St. Louis, No. 1	6.00- 6.50
St. Louis, No. 2	8.00- 8.50

SPECIFICATION PIPE

Boston	3.00- 3.25
Eastern Pa.	9.00- 9.50
New York, dealers	3.50- 4.00

BUSHELING

Buffalo, No. 1	9.00- 9.25
Chicago, No. 1	8.50- 9.00
Cinci., No. 1, deal.	6.00- 6.50
Cincinnati, No. 2	2.75- 3.25
Cleveland, No. 2	6.50- 7.00
Detroit, No. 1, new	6.50- 7.00
Valleys, new, No. 1	11.00-11.50

MACHINE TURNINGS

Birmingham	4.50- 5.00
Boston, dealers	1.00- 1.25
Buffalo	4.50- 5.00
Chicago	5.50- 6.00
Cincinnati, dealers	3.50- 4.00
Cleveland	6.00- 6.50
Detroit	4.00- 4.50
Eastern Pa.	6.00- 6.50
New York, dealers	1.75- 2.25
Pittsburgh	7.00- 7.50
St. Louis	3.00- 3.50
Valleys	8.00- 8.50

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	3.25- 3.50
Buffalo	5.50- 6.00
Cincinnati, dealers	4.50- 5.00
Cleveland	6.50- 7.00
Detroit	4.75- 5.25
Eastern Pa.	5.00
New York, dealers	1.50- 1.75
Pittsburgh	6.50- 7.00

CAST IRON BORINGS

Birmingham, plain	4.50- 5.00
Boston, chemical	5.50- 6.50
Boston, dealers	3.25- 3.50
Buffalo	5.50- 6.00
Chicago	5.00- 5.50
Cincinnati, dealers	3.50- 4.00
Cleveland	6.50- 7.00
Detroit	4.50- 5.00
E. Pa., chemical	11.00-12.00
New York, dealers	1.50- 1.75
St. Louis	3.50- 4.00

PIPE AND FLUES

Cincinnati, dealers	5.00- 5.50

RAILROAD GRATE BARS

Buffalo	7.00- 7.50
Chicago, net	6.00- 6.50
Cincinnati	4.00- 4.50
Eastern Pa.	8.50- 9.00
New York, dealers	4.00- 4.50
St. Louis	4.50- 5.00

FORGE FLASHINGS

Boston, dealers	4.50- 5.00
Buffalo	9.00- 9.25
Cleveland	8.00- 8.50
Detroit	7.00- 7.50
Pittsburgh	10.50-11.00

FORGE SCRAP

Boston, dealers	5.00- 5.25
Chicago, heavy	11.00-11.50
Eastern Pa.	9.50-10.00

ARCH BARS, TRANSOMS

St. Louis	9.50-10.00

AXLE TURNINGS

Boston, dealers	3.00- 3.50
Buffalo	7.50- 8.00
Chicago, elec. fur.	10.00-10.50
Cleveland	7.00- 7.50
Eastern Pa.	9.00- 9.50
St. Louis	6.50- 7.00

STEEL CAR AXLES

Birmingham	12.50-13.00
Boston, ship. point.	10.00-10.50
Buffalo	12.00-12.50
Chicago, net	13.50-14.00
Eastern Pa.	16.50-17.00
St. Louis	12.00-12.50

SHAFTING

Boston, ship. point.	11.75-12.00
Eastern Pa.	16.50-17.00
New York, dealers	12.50-13.00
St. Louis	11.00-11.50

CAR WHEELS

Birmingham	9.00- 9.50
Boston, iron deal.	6.00- 6.50
Buffalo, iron	11.00-11.50
Buffalo, steel	12.00-12.50
Chicago, iron	10.50-11.00
Chicago, rolled steel	11.50-12.00
Cincinnati, iron	8.00- 8.50
Eastern Pa., iron	10.50-11.00
Eastern Pa., steel	13.50-14.00
Pittsburgh, iron	12.00-12.50
Pittsburgh, steel	14.00-14.50
St. Louis, iron	7.00- 7.50
St. Louis, steel	9.50-10.00

NO. 1 CAST SCRAP

Birmingham	9.50-10.00
Boston, No. 1 mach.	8.50- 9.00
Boston, No. 2	7.50
Boston, tex. con.	8.50- 9.00
Buffalo, cupola	10.00-10.25
Buffalo, mach.	10.50-11.00
Chicago, agri. net	8.00- 8.50
Chicago, auto	9.00- 9.50
Chicago, mach. net	9.00- 9.50
Chicago, railr'd net	8.50- 9.00
Cinci., mach. cup	8.50 9.00
Cleveland, cupola	11.50-12.00
Detroit, net	9.50-10.00
Eastern Pa., cupola	11.50-12.00
Pittsburgh, cupola	11.50-12.00
San Francisco, del.	13.50-14.00
Seattle	7.00- 8.50
St. Louis, No. 1	8.00- 8.50
St. L., No. 1 mach.	8.50- 9.00

HEAVY CAST

Boston, del.	5.25- 5.50
Buffalo, break.	8.00- 8.50
Cleveland, break.	8.50- 9.00
Detroit, auto, net	9.50-10.00
Detroit, break.	7.00- 7.50
Detroit, auto net	9.50-10.00
Eastern Pa.	10.00-10.50
N. Y. break. deal.	5.75- 6.25
Pittsburgh	10.50-11.00

MALLEABLE

Boston, consum.	12.00-12.50
Buffalo	12.50-13.00
Chicago, R. R.	13.00-13.50
Cincinnati, agri. del.	8.25- 8.75
Cleveland, rail	12.00-12.50
Detroit, auto	11.00-11.50
St. Louis, R. R.	9.50-10.00
Eastern Pa., R. R.	11.00-11.50

RAILS FOR ROLLING

5 feet and over

Birmingham	11.00-11.50
Boston, dealers	8.00- 8.50
Buffalo	10.00-10.50
Chicago	11.00-11.50
Eastern Pa.	12.50-13.00
New York, dealer	7.50- 8.00
St. Louis	10.00-10.50

LOCOMOTIVE TIRES

Chicago (cut)	11.50-12.00
St. Louis, No. 1	10.00-10.50

LOW PHOS. PUNCHINGS

Buffalo	12.00-12.50
Chicago	12.00-12.50
Eastern Pa.	13.00-14.00
Pittsburgh	13.00-13.50

Iron Ore

Lake Superior Ore

Gross ton, 51½%

Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

Eastern Local Ores

Cents, unit, del. E. Pa.

Foundry and basic 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

Foreign Ore

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.00
No. Afr. & low phos.	10.00
Swedish basic, 65%	9.00
Swedish low phos.	10.00
Spanish No. Africa basic, 50 to 60%	9.00
Tungsten, spot, sh. ton unit, duty pd.	$17.75-18.25
N. F. fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$18.00-19.50

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots.

Caucasian, 52-55%	26.00
So. African, 52%	26.00
So. Afr., 49-51%	24.00
Indian, 58-60%	nominal
Indian, 48-50%	nominal

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	
Baltimore*	2.90c
Boston††	2.95c
Buffalo	3.00c
Chattanooga	3.31c
Chicago	2.95c
Cincinnati	3.15c
Cleveland	2.95c
Detroit	3.03½c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.06c
New Orleans	3.30c
New York‡(d)	3.22c
Pittsburgh(h)	2.25-2.50c
Philadelphia*	2.90c
San Francisco	3.60c
Seattle	3.60c
St. Louis	3.19c
St. Paul	3.00c
Tulsa	3.25c
IRON BARS	
Portland	3.40c
Chattanooga	3.31c
Baltimore*	3.00c
Chicago	2.75c
Cincinnati	3.15c
New York‡(d)	3.32c
Philadelphia*	2.90c
St. Louis	3.19c
Tulsa	3.25c
REINFORCING BARS	
Buffalo	2.60c
Chattanooga	3.31c
Chicago	2.10c-2.60c
Cleveland (c)	2.10c
Cincinnati	3.25c
Houston	3.25c
Los. Ang., cl.	2.45c
New Orleans	3.50c
Pitts., plain (h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	2.45c
St. Louis	3.24c
Tulsa	3.25c
Young.	2.30c-2.60c
SHAPES	
Baltimore*	2.95c
Boston††	3.17c
Buffalo	3.25c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.40c
Cleveland	3.31c
Detroit	3.40c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York(d)	3.37c
Philadelphia*	2.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.44c
St. Paul	3.25c
Tulsa	3.50c
PLATES	
Baltimore*	2.95c
Boston††	3.18c
Buffalo	3.37c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.40c
Cleveland, ¼-in. and over	3.31c
Detroit	3.46c
Detroit, ¼-in.	3.65c
Houston	3.00c
Los Angeles	3.60c
Milwaukee	3.31c
New Orleans	3.55c
New York(d)	3.40c
Philadelphia*	2.95c
Phila. floor	4.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.44c
St. Paul	3.25c
Tulsa	3.50c
NO. 10 BLUE	
Baltimore*	3.05c
Boston††	3.25c
Buffalo	3.62c
Chattanooga	3.36c
Chicago	3.05c
Cincinnati	3.20c
Cleveland	3.11c
Det., 8-10 ga.	3.13½c
Houston	3.35c
Los Angeles	3.70c
Milwaukee	3.16c
New Orleans	3.55c
New York	3.27c
Portland	3.75c
Philadelphia*	3.05c
Pittsburgh(h)	2.95c
San Francisco	3.75c
Seattle	3.75c
St. Louis	3.29c
St. Paul	3.45c
Tulsa	3.70c
NO. 24 BLACK	
Baltimore*†	3.51c
Boston (g)	3.90c
Buffalo	3.25c
Chattanooga	4.21c
Chicago	3.85c
Cincinnati	4.05c
Cleveland	3.91c
Detroit	3.98½c
Los Angeles	4.35c
Milwaukee	3.96c
New York	3.85c
Philadelphia*†	3.55c
Pitts.** (h)	3.55c
Portland	4.40c
San Francisco	4.40c
Seattle	4.40c
St. Louis	4.09c
St. Paul	3.695c
Tulsa	4.75c
NO. 24 GALV. SHEETS	
Baltimore*†	4.21c
Buffalo	4.00c
Boston (g)	4.60c
Chattanooga	4.86c
Chicago (h)	4.55c
Cincinnati	4.70c
Cleveland	4.61c
Detroit	4.70c
Houston	4.40c
Los Angeles	4.95c
Milwaukee	4.66c
New Orleans	4.95c
New York	4.50c
Philadelphia*†	4.25c
Pitts.** (h)	4.15-4.45c
Portland	5.00c
San Francisco	5.00c
Seattle	5.00c
St. Louis	4.79c
St. Paul	4.19c
Tulsa	5.10c
BANDS	
Baltimore*	3.15c
Boston††	3.25c
Buffalo	3.42c
Chattanooga	3.61c
Chicago	3.30c
Cincinnati	3.45c
Cleveland	3.36c
Detroit, ¼-in. and lighter	3.38½c
Houston	3.25c
Los Angeles	4.10c
Milwaukee	3.41c
New Orleans	3.95c
New York(d)	3.62c
Philadelphia	3.15c
Pittsburgh(h)	3.20c
Portland	4.25c
San Francisco	4.25c
Seattle	4.25c
St. Louis	3.54c
St. Paul	3.20c
Tulsa	3.45c
HOOPS	
Baltimore	2.30c
Boston	4.25c
Buffalo	3.42c
Chicago	3.30c
Cincinnati	3.45c
Det., No. 14 and lighter	3.38½c
Los Angeles	5.85c
Milwaukee	3.41c
New York	3.62c
Philadelphia	3.40c
Pittsburgh(h)	3.70c
Portland	5.60c
San Francisco	6.15c
Seattle	5.60c
St. Louis	3.54c
St. Paul	3.75c
COLD. FIN. STEEL	
Baltimore (c)	3.71c
Boston	3.85c-4.00c
Buffalo (h)	3.55c
Chattanooga*	4.06c
Chicago (h)	3.50c
Cincinnati	3.70c
Cleveland (h)	3.50c
Detroit	3.63½c
Los Ang.(f) (d)	5.85c
Milwaukee	3.61c
New Orleans	4.30c
New York	3.92c-4.42c
Philadelphia	3.73c
Pittsburgh(h)	3.45c
Portland (f)	6.00c
San Fran.(f) (d)	5.95c
Seattle (f) (d)	6.00c
St. Louis	3.74c
St. Paul	3.20c
Tulsa	4.65c
COLD ROLLED STRIP	
Boston, 0.100-in., 500 lb. lots	5.35c
Buffalo	3.39c
Chicago	3.27c
Cincinnati(b)	3.42c
Cleveland (b)	3.20c
Detroit	3.33c
New York	4.70c
St. Louis	3.36c
TOOL STEELS	
(Applying on or east of Mississippi river; west of Mississippi 1c up)	Base
High speed	57c
High carbon, high chrome	37c
Oil hardening	22c
Special tool	20c
Extra tool	17c
Regular tool	14c
Uniform extras apply	
BOLTS AND NUTS	
(100 pounds or over)	Discount
Chicago (a)	70
Cleveland	70
Detroit	70
Milwaukee	70
Pittsburgh	70

(a) Under 100 pounds, 65 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Minus quant. diff.; (e) New mill classif.; (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less.

‡Domestic bars; *Plus quan. extras; **Under 25 bundles; *†50 or more bundles; †New extras apply; ††Base 40,000 lbs. extras on less.

Prices on heavier lines are subject to new quantity differentials; 399 lbs. and less, up 50 cts.; 400 to 9999 lbs., base; 10,000 to 19,999 lbs., 15 cts. under; 20,000 to 39,999 lbs., 25 cts. under; 40,000 lbs. and over, 35 cts. under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, March, 28

Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
PIG IRON			
Foundry, 2.50-3.00 Silicon	$15.03 3 2 6	$13.99	1 14 0
Basic bessemer	13.23 2 15 0*	12.67	1 12 0
Hematite, Phos. .03-.05	15.03 3 2 6	.....	.....
SEMIFINISHED STEEL			
Billets	$26.45 5 10 0	$19.33	2 7 0
Wire rods, No. 5 gage	37.52 7 16 0	37.04	4 10 0
FINISHED STEEL			
Standard rails	$37.29 7 15 0	$45.88	5 10 0
Merchant bars	1.61c 7 10 0	1.17c to 1.22c	3 2 6 to 3 5 0
Structural shapes	1.58c 7 7 6	1.15c	3 1 6
Plates, †¼ in. or 5 mm.	1.71c 8 0 0	1.54c	4 2 6
Sheets, black, 24 gage or 0.5 mm.	1.98c 9 5 0	2.16c	5 16 0††
Sheets, gal., 24 gage, corr.	2.41c 11 5 0	2.42c	6 10 0
Bands and strips	1.82c 8 10 0	1.49c	4 0 0
Plain wire, base	1.98c 9 5 0	1.99c	5 7 6
Galvanized wire, base	2.41c 11 5 0	2.33c to 2.37c	6 5 6 to 6 7 6
Wire nails, base	2.57c 12 0 0	2.15c	5 15 0
Tin plate, box 108 lbs.	$ 4.33 0 18 2	.....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d $(43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d	French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$16.23 3 7 6(a)	$17.13	260	$13.02	310	$25.30 63
Basic bessemer pig iron	16.23 3 7 6(a)*	12.19	185	11.76	280	27.91 (b)69.50
Furnace coke	3.97 0 16 6	7.91	120	4.62	110	7.63 19
Billets	26.45 5 10 0	28.34	430	18.48	440	38.76 96.50
Standard rails	1.77c 8 5 0	2.08c	694	2.09c	1,100	2.40c 132
Merchant bars	1.84c 8 12 0	1.68c	560	1.05c	550	2.00c 110
Structural shapes	1.87c 8 15 0	1.65c	550	1.05c	550	1.96c 107.50
Plates, †¼-in. or 5 mm.	1.94c 9 1 3	2.10c	700	1.33c	700	2.31c 127
Sheets, black	2.25c 10 10 0§	2.55c	850‡	1.47c	775‡	2.62c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	2.78c 13 0 0	4.05c	1,350	2.85c	1,500	6.73c 370
Plain wire	1.98c 9 5 0	3.39c	1,130	2.09c	1,100	3.15c 173
Bands and strips	2.00c 9 7 0	1.95c	650	1.33c	700	2.31c 127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel a del. Middlesbrough. b hematite. ††Close annealed

**Gold pound sterling carries a premium of 69 per cent over paper sterling.

Bars

Bar Prices, Page 62

Cleveland — Steel bar tonnage booked here in March was down 10 per cent from the total for February. Miscellaneous demand is still fairly good and some sellers noted a slight improvement last week in orders from equipment manufacturers, although specifications from automobile interests were lighter. An increase in ingot production by a Cleveland steelworks is attributable mainly to open market sales of semifinished steel.

Railroads April 1 restore the remaining 5 per cent of the 10 per cent wage cut made in 1933, and the added wage outlay may interfere with purchases this year. They restored the first 5 per cent last fall.

Pittsburgh — The 1.80c base on hot-rolled bars is carrying over into the present quarter. Forward bar buying appears to have dropped off somewhat, but day-to-day releases from important buyers, among which the automotive trade is outstanding, are on a sustained and steady basis.

Chicago — Steel bar activity continues to draw considerable support from requirements of miscellaneous consumers, and needs of farm implement manufacturers are well maintained. Automotive consumption also is holding well. The outlook for April is regarded as favorable, though forward buying is only moderate.

Boston—Demand for commercial steel, alloy and forging bars is steady, in small prompt lots. Stocks are light, but there is practically no buying far in advance.

New York—Domestic sellers report buying as spotty, with foreign offerings exerting a depressing influence. Apart from routine quarterly requirements, railroads are showing little interest and bolt and nut manufacturers are specifying less actively than any time this year, it appears. The domestic market is 1.80c, Pittsburgh, or 2.13c, New York.

Philadelphia — Cold drawers, the most active factors in the steel bar market in recent weeks, are now specifying less, with the general market quiet. Prices are unchanged at 1.80c, Pittsburgh, or 2.09c, Philadelphia.

Tin Plate

Tin Plate Prices, Page 62

Pittsburgh—A further gain in tin plate mill operations places the average close to 90 per cent. Canmakers' specifications have been so heavy that producers' backlogs are small, even at this advanced rate. Producers say the 90 per cent rate will be held for at least six weeks. Prices of tin mill products are steady at $5.25 per base box for standard tin plate; 3.40c for No. 24 unassorted long ternes; 2.75c on 28 gage tin mill black sheets.

Plates

Plate Prices, Page 62

Pittsburgh — American Oil Co., American building, Baltimore, is expecting to ask bids soon for construction of six or nine 192-foot gasoline barges for use in the Pittsburgh district in construction of a river landing and several storage tanks near Beck's Run on the Monongahela river. It is estimated that from 1200 to 2000 tons of plates will be required and an unstated tonnage additional for storage tank facilities at the river landing. Bids will be taken April 1 on repairs to the United States towboat, PENOVA, by the Pittsburgh federal engineers, and will require 1200 square feet of plates. Bids for repairing three steel dump scows will be taken April 2 by the same office, requiring plates and steel castings. Pittsburgh Coal Co. bid low on March 27 at $14,411.81 for repairs to nine steel cargo box barges for the army engineers.

Cleveland — Carload orders of plates from manufacturers of glass-lined and other types of small tanks have increased in number, but from other sources demand appears to be slower, and the Cleveland plate mill, which recently operated at 45 per cent, is down to 25 per cent. Specifications for some light gage material usually rolled on sheet mills have been diverted to plate mills because sheet mills have been too busy to accept them. Oil industries and railroads are practically out of the plate market. For a coal tipple for the Snow Hill Coal Co., Terre Haute, Ind., an Ohio fabricator has specified on 250 tons of plates and shapes.

Chicago — Inquiries for fabricated plates are few, activity having declined rather sharply the past two weeks. Awards include 600 tons for a municipal water tank at Aurora, Ill. Miscellaneous plate orders show no improvement, with demand from railroads also light. Fairly large tonnages still are pending for various government projects.

Boston — Miscellaneous small orders continue to furnish most business on plates. Shipments for navy yard work are heavier against orders placed some weeks ago. The Connecticut yard building several submarines is also taking more plates. Industrial and shop fabricating demand is light, but unchanged. Bids close this week on a 100-ton standpipe for Hinsdale, N. H.

New York—A substantial tonnage of plates will be required for fabricated steel pipe now being placed for the city. A Bronx waterworks contractor has closed with McClintic-Marshall Corp., Bethlehem, Pa., for 1300 tons and Atlas Water Works 1000 tons with National Tube Co., Pittsburgh. Oakhill Contracting Co., Queens, N. Y., is expected to place at once 800 tons and P. Thomasetti, contractor, Brooklyn, is about to award 1400 tons. The latter work is for Queens and the remainder for the Bronx. The pipe is 24, 36 and 48 inches, with most of the latter diameter. Buffalo will readvertise for pipe requiring about 1200 tons of plates. Platemakers are interested in the naval appropriation bill about to be presented to Congress seeking approval of 12 destroyers, six submarines, three heavy cruisers, two light cruisers and an aircraft carrier.

Philadelphia — Plate sellers are waiting with interest the award of the two tankers for the Gulf Refining Co., New York, on which bids were opened late last week. These tankers would require close to 8000 tons of plates, shapes and bars, mainly plates. Despite recent reports to the contrary, it now appears that the Erie ferryboat will not be readvertised and that the Sun Shipbuilding Co., Chester, Pa., previously noted as having been tentatively awarded the contract, will start distributing the steel shortly. The navy department opened bids last week on 300 to 400 tons of galvanized plates, of which 200 tons will be required for work in Philadelphia. Tank work continues generally disappointing to plate sellers. Prices are unchanged at 1.90c, Coatesville, Pa., or 1.98½c, Philadelphia.

San Francisco—The metropolitan water district, Los Angeles, has taken bids on 3500 tons of 32-inch welded steel pipe. Bids open next week on 250 tons for a 50-foot outlet pipe for the Coyote dam, San Jose, Calif., and on 200 tons for two 300-horsepower boilers for the state hospital at Camarillo, Calif.

Seattle—Boiler and fabricating plants report increased inquiry, particularly from industrial sources and several small jobs have been placed. The largest tonnage pending requires more than 1800 tons for a Tacoma pipe line, bids to be asked for next month. About 400 tons are pending for 69 tanks to be installed in the addition, now under construction, to the Century Brewing association plant at Seattle.

Contracts Placed

600 tons, siphon at Paxton, Nebr., to

Kansas City Structural Steel Co., Kansas City, Mo.

600 tons, 1,500,000-gallon elevated water tank, Aurora, Ill., to Chicago Bridge & Iron Works, Chicago.

Contracts Pending

5000 to 6000 tons, two tankers for the Gulf Refining Co., 17 Battery Place, New York, bids opened March 28; including shapes and bars, approximately 8000 tons of steel are required.

3500 tons, 32-inch welded pipe, metropolitan water district, Los Angeles, specification 1641; bids opened.

1400 to 2000 tons, six or nine 192-foot oil barges for American Oil Co., Baltimore, for Pittsburgh district service.

400 tons, 69 tanks for Century Brewing association, Seattle; bids in.

390 tons, 16 and 36-inch pipe line, Everett, Wash.; bids soon.

250 tons, 50-inch outlet pipe, Coyote dam and spillway, Santa Clara valley water conservation district, San Jose, Calif.; bids April 5.

200 tons, two 300-horsepower boilers, state hospital, Camarillo, Calif.; bids April 2.

Sheets

Sheet Prices, Page 62

Pittsburgh — Sheet specifications last week showed a slight decline, but producers' backlogs, especially in cold-reduced sheets, extend six to seven weeks. One local independent mill's cold-rolled sheet capacity is reported sold out through May. Effective April 1, the recently reported advance in wasters and seconds goes in effect, increases ranging from $2 to $8 a ton. Sheet primes are steady at 1.85c, Pittsburgh, for No. 10 gage hot-rolled; 3.10c, Pittsburgh, for galvanized and 2.40c for black sheets. Cold-rolled bases hold at 2.50c and 2.95c, Pittsburgh, for No. 20 gage. A large Pittsburgh manufacturing concern is preparing to announce quantity production of kitchen sinks stamped from sheet metal.

Cleveland—Specifications on weekly quotas due some of the leading automobile manufacturers have been held up, causing the first break in sheet production since the rise began in January. From capacity operations, held for several weeks, the Cleveland mills are down to 75 per cent. In an adjacent lake district, sheet mills operated at capacity last week, but probably will readjust schedules within a few days. Retail dealers appear to have ample stocks of automobiles for the present, and sheetmakers believe the peak in automobile production has been reached. They have not received sheet orders from this source for May. On the other hand, fabricators of enameling sheets are heading into a busier period, and releases in some instances have increased.

Chicago—While fairly large specifications have been received for April shipment, the outlook for the month is somewhat less favorable than the experiences of the quarter just ended. The decline in sales and specifications is attributed both to a moderate recession in consumption as well as to the more cautious attitude consumers have adopted in placing new business. Automotive consumption is expected to hold well during the next 30 days, while some other industries, including the farm implement and electrical refrigeration, have favorable prospects for the near future.

Boston—Slight change is noted in sheet volume. Jobbers are buying sparingly and full car shipments are scattered. Some mills on special and cold finished sheets are unable to deliver in less than three weeks.

New York—Although less brisk than earlier in the month, sheet business still is fairly active. Good tonnage continues to move into production of refrigerators, washing machines and stoves. Building requirements remain light. Prices are unchanged.

Philadelphia—Miscellaneous sheet buying appears less active. While stovemakers fabricate considerable metal, at this season of the year most of their requirements have been specified. Better autobody releases appear assured for next month, but building construction holds little of promise. Prices are steady.

Washington—District commissioners close April 3 on District of Columbia automobile license tag stock, 360,000 pieces, each 6⅛ x 12⅝ inches.

Buffalo — Buffalo district sheet mills continue to operate at 75 per cent. Pressure for deliveries has eased and it may not be possible to continue this rate.

Cincinnati — Demand for cold-rolled sheets is active, though not equal to the mark established when automobile manufacturers swung into production on 1935 models. Labor difficulties in a refrigerator and radio plant here temporarily have clouded the outlook for shipments.

St. Louis—Some slowing in new orders is reported by manufacturers and distributors. Specifications, however, continue satisfactory.

Birmingham, Ala.—An unusual demand for sheets still is noted in the South. Sales promotion plans to utilize new uses on farms are being fostered by two large producers.

Seattle—Demand has improved, and sales volume is increasing. Service station and repair work is active, while public projects are adding to the total. Corrugated Culvert Co. is reported low at $10,270 f.o.b. Ashland, Ky., for furnishing the Alaska road commission 12,256 feet of corrugated galvanized culverts 14 and 16 gage, 12 to 48-inch diameter.

Transportation

Track Material Prices, Page 63

Rail buying forms the most important development in the railroad market at the moment, placing of 30,000 tons at Chicago being the leading factor. Chicago & North Western has divided 25,000 tons and Chicago Great Western 5000 tons between Illinois Steel Co. and Inland Steel Co., Chicago. The former also distributed about 9000 tons of accessories to a number of suppliers. About 3000 to 4000 tons of accessories have been placed recently in small lots.

The eastern roads are not buying currently but the Erie, Chesapeake & Ohio and Nickel Plate are expected to come into the market soon for some tonnage, estimated at a total of 40,000 tons. Baltimore & Ohio and Pennsylvania state they have sufficient rails carried over from 1934 to meet their requirements for some time. Interstate commerce commission has approved a PWA loan of $212,500 to the Gulf, Mobile & Northern, Mobile, Ala., to cover its purchase of 3218 tons of rails and 700 tons of fastenings from the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

Interest is being revived in a proposed list of 500 subway cars for the board of transportation, New York, on which bids are likely to be asked within 30 days. Alternative bids will be asked on 300 and 500 trolley cars by the electric railway presidents' conference committee through the Brooklyn & Queens Transit Co., a subsidiary of the Brooklyn-Manhattan Transit Co., Brooklyn. Car demand otherwise is negligible.

Restoration of the remaining 5 per cent of the 10 per cent cut in railroad wages in 1933 may affect the ability of some carriers to purchase material. Two and one-half per cent of the reduction was restored last September, 2½ per cent in January, and 5 per cent increase is to become effective April 1.

Locomotives Placed

Seaboard Air Line, four locomotive tenders, to Baldwin Locomotive Works, Philadelphia.

Rail Orders Placed

Chicago Great Western, 5000 tons; 4000 tons to Illinois Steel Co., Chicago, 1000 tons to Inland Steel Co., Chicago.

Chicago & North Western, 25,000 tons, 100 and 112-pound; 18,000 tons to Illinois Steel Co., Chicago, 7000 tons to Inland Steel Co., Chicago; accessories

totaling 9000 tons, placed with ten producers.

Buses Placed

American Car & Foundry Motors Co., New York: Nine 30-passenger, for Reading Coach Co., Reading, Pa.; three 40-passenger, for Boston Elevated Railway, Boston; two 25-passenger parlor buses, for Nairn Transport Co., Damascus, Syria; two 29-passenger, for Staten Island Coach Co., Staten Island, N. Y.; one 36-passenger, for Norfolk-Southern Bus Corp., Norfolk, Va.

Twin Coach Corp., Kent, O.; Thirteen 23-passenger, for Mississippi Power & Light Co., Jackson, Miss.; ten 30-passenger, for East Bay Street Railway Ltd., Oakland, Calif.; four 31-passenger and four 23-passenger, for Honolulu Rapid Transit Co., Honolulu, T. H.; twenty-eight 30-passenger, for Kansas City Public Service Co., Kansas City; one 23-passenger, for Woodlawn & Southern Motor Coach Co., Aliquippa, Pa.

Pipe

Pipe Prices, Page 63

Pittsburgh—Tube mill operations in this district showed slight deviation by weeks through March remaining at 30 to 35 per cent of capacity until last week when National Tube Co., temporarily suspended operations at its McKeesport, Pa., works and operations for the industry dropped to about 25 per cent. Last week, James V. Allred, governor of Texas, requested the state legislature to pass a bill creating the Gas Conservation Corp., which will be authorized to negotiate for purchase and sale of gas and construction and operation of pipelines on behalf of that state. It is planned to seek an advance of $60,000,000 from the PWA to construct a line from Texas to St. Louis and Detroit.

Chicago—Releases against old cast pipe orders are more numerous and are expected to increase further with the approach of milder weather. New business, however, is light, while inquiries also are slow to improve. Bids have been taken on about 1000 tons of various sizes of cast pipe and fittings for the Stickney, Ill., sewage disposal plant.

New York—Cast pipe inquiry is up slightly with more medium-tonnage requirements being bid. For a project at Lackawanna, N. Y., 2000 tons have been bought. Bids on 2700 tons, 36-inch, for Buffalo, N. Y., with alternates on welded steel, have been rejected and the material will be readvertised soon, specifications now being revised. The city has awarded 5000 tons of cast pipe.

Boston—Cast pipe inquiry is heavier, East Smithfield, R. I., having bids on 1100 tons, the largest pending purchase. Wareham, Mass., bought 1200 tons from the Florence, N. J., foundry. Merchant steel pipe has improved slightly through jobbers, but larger sizes and full car orders for specific projects are slack. Wrought pipe buying in March was below the first two months of the year.

San Francisco—Activity in cast pipe is by no means pronounced and little tonnage has been closed so far this year by municipalities. However, outlook for the first half of the year is encouraging. Identical bids of $6.05 per 100 feet were submitted by a number of sellers on 100,000 feet of ¾-inch standard galvanized pipe for San Francisco.

Seattle—Large pipe projects are developing slowly and immediate volume is confined to small tonnages out of stock.

Cast Pipe Placed

5000 tons, 30-inch and under, New York, divided between United States Pipe & Foundry Co., Burlington, N. J., and Warren Foundry & Pipe Co., Phillipsburg, N. J., through contractors.

2100 tons, 6 to 16-inch, Chicago, to United States Pipe & Foundry Co., Burlington, N. J., and Lynchburg Foundry Co., Lynchburg, Va.

1200 tons, 10-inch and under, Wareham, Mass., to R. D. Wood & Co., Florence, N. J.

282 tons, Oakley, Utah, to unnamed interest.

Cast Pipe Pending

1100 tons, East Smithfield, R. I.

1000 tons, various sizes, with fittings, sewage disposal plant, Chicago sanitary district, Stickney, Ill.

460 tons, 4, 6 and 8-inch, Mountain Home, Idaho; bids April 2.

273 tons, 4 and 6-inch, class 150, Enterprise, Utah; bids in.

200 tons, Hinsdale, N. H.; bids April 4.

162 tons, 12 to 16-inch, class 150, Beverly Hills, Calif.; bids in.

Steel Pipe Pending

Unstated tonnage, 10,800 feet of 4-inch, alternates on wood, Yachats water district, Lincoln county, Oregon; bids April 6.

100 tons, 30-inch, 1250-foot welded line under Maumee river, Toledo, O.; bids in.

Strip Steel

Strip Prices, Page 63

Pittsburgh—Entering second quarter, strip steel producers have backlogs for about two weeks at their present rate of 50 per cent operation. Cold-rolled strip steel capacity is about 60 per cent engaged, with about three weeks promised for deliveries. Last week an encouraging turn in strip buying came from many buyers who last bought heavily in January, and are now replenishing. Strip is quoted 1.85c for hot-rolled and 2.60c, base Pittsburgh or Cleveland, for cold-rolled.

Cleveland—Production of strip steel here last week dropped to 75 per cent, due to a decline in specifications from automobile manufacturers. Strip mill operations had been supported at capacity almost entirely from automobile sources for more than a month.

Chicago—Strip demand is declining, the recession in cold-rolled being marked. While part of the drop in orders is attributed to a decrease in consumption, most users are comfortably fixed as regards stocks. Requirements of the automotive industry hold at their previous high rate.

Boston—Buying of steel strip is well distributed, but not heavy and mills still experience difficulty in securing sizes and specifications for sustained runs. Buying of hot-rolled strip follows closely the activity of rerollers, indicating light stocks held by most of the latter.

New York—Consumption of cold strip is still heaviest with manufacturers of automobile accessories, and while this is easing off, the outlook for at least another month is promising. Movement of cold strip in other directions is light.

Philadelphia—Another dull week is noted in narrow strip, with prices unchanged at 1.85c, Pittsburgh, or 2.14c, Philadelphia, for hot strip and 2.60c, Pittsburgh, or 2.89c, for cold strip.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 63

Railroad demand for bolts and nuts is slightly more active at Chicago and heavier shipments are in prospect for second quarter.

At Cleveland, specifications from automobile manufacturers are holding up, but from other sources are smaller. Comparatively few consumers are not signing contracts at the recently advanced prices for second quarter, and as automobile interests were protected for that period at former levels the new quotation of 70-10-5 off list for bolts and nuts has not been fully tested. Small rivets are quoted at 70-5 off list, and wrought washers, $6.25 off, all basing points.

The navy is asking bids April 12 on 81 tons of steel rivets for delivery to the Brooklyn navy yard.

Quicksilver

New York—Quicksilver prices are unchanged in a quiet market. Round lots of 100 virgin flasks of 76 pounds are held at $72.50 a flask, but small lots range higher with 15 to 24 flasks, inclusive, quoted $74.

Shapes

Structural Shape Prices, Page 62

New York—While inquiry for bridges is slightly heavier, active pending tonnage is not impressive. Bids are expected to be asked shortly on close to 20,000 tons additional for the Triboro bridge, New York. Some buying is delayed by slow approval of PWA contracts. Awards during the week were light.

Fabricated structural steel bookings during February approximated in volume the business done in the month last year, according to the American Institute of Steel Construction. The large drop in bookings during January, however, keeps the record of business to date this year under last year's average. The backlog today is approximately 34 per cent less than it was at this time last year.

Pittsburgh—American Bridge Co., Pittsburgh, has taken a contract for 1460 tons for state grade separation work at East St. Louis, Ill., but other contracts closed here have been small. Award of 10,300 tons for the new Great Lakes Steel Corp. strip mill building has been delayed. An inquiry is out for 500 tons for an Allegheny county, Pennsylvania home. The 1.80c, Pittsburgh, base on plain structurals is steady.

Cleveland—Award of 400 tons of steel piling for the Wheeling & Lake Erie railroad's dock at Huron, O., to Carnegie Steel Co., features the market. About 100 tons of reinforcing steel also will be purchased. Western Automatic Machine Screw Co., Elyria, O., has issued specifications for a building requiring 200 to 250 tons. State bridge work has developed only small lots so far this year, and fabricators now have been informed no additional tonnage will be required for two to three months.

Chicago—Bids will be taken during the first half of April on three large projects requiring about 15,000 tons. These include the Ft. Peck, Mont., and Alton, Ill., dams, taking 5000 and 7000 tons respectively, and the San Antonio, Tex., post office, 3500 tons. New inquiries are almost wholly lacking, while awards recently are made up principally of individual lots of less than 500 tons.

Boston—About 7500 tons of steel sheet piling and 500 tons of miscellaneous steel are required for repairs to the army base piers, Boston, bids April 9. This is the largest piling inquiry in several years. Except for this project shape inquiry is light and buying is sluggish.

Philadelphia — Structural buying includes 300 tons for transmission towers by the Pennsylvania Power & Light Co., Allentown, Pa. Several hundred tons of small angles will be required for government cots to be built by the Bunting Glider Co., this city. This company received orders for approximately 90,000 of these cots, with the Barcalo Mfg. Co., Buffalo, and the Harris-Hub Bed & Spring Co., Chicago, dividing the remainder of more than 120,000 of these units. Including tubing, springs and certain other descriptions, the Bunting company's total steel requirements for this work will be around 2000 tons.

San Francisco—Structural awards were the largest in over four weeks and totaled 1535 tons. Orton Crane & Shovel Co., Chicago, booked 200 tons for two 20-ton cranes for the Mare Island, Calif., navy yard. Bids open April 10 for 340 tons for a bridge over Feather river, Plumas county, California. Government and state work continues to comprise over 90 per cent of new business.

Seattle—Local fabricating plants report an increase in small contracts for repair work, service stations and other industrial improvements, while public works projects continue to call for fairly heavy tonnages. Pacific Car & Foundry Co., Seattle, is awaiting official award of the Bonneville, Oreg., stop-log portable dams requiring 410 tons of nickel steel shapes and steel castings.

Shape Contracts Placed

1200 tons, superstructure, TVA bridge, Clinch river, New Tazewell, Tenn., to Nashville Bridge Co., Nashville, Tenn.

800 tons, public school No. 149, Queens, New York, to Harris Structural Steel Co., New York, through William L. Crow Construction Co.

745 tons, municipal water conservation district, Maricopa county, Arizona, schedules 1,5 and 4, to Mississippi Valley Structural Steel Co., Decatur, Ill.

475 tons, building, Fleischmann Malting Co., Chicago, to Joseph T. Ryerson & Son Inc., Chicago.

475 tons, bridge, Kerrville, Tex., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

400 tons, piling, dock at Huron, O., for Wheeling & Lake Erie railroad, Cleveland; to Carnegie Steel Co., Pittsburgh.

370 tons, addition, truck plant, Detroit, to R. C. Mahon Co., Detroit.

330 tons, New York Central railroad bridge, West 171st street, New York, to McClintic-Marshall Corp., Bethlehem, Pa.

300 tons, transmission towers, Pennsylvania Power & Light Co., Allentown, Pa., to the Lehigh Structural Steel Co., Allentown.

300 tons, building, Trinity college, Hartford, Conn., to Lehigh Structural Steel Co., Allentown, Pa.

300 tons, refinery at Woodriver, Ill., Shell Petroleum Co., to Superior Structural Steel Co., St. Louis.

275 tons, sewage disposal plant, Coney Island, Brooklyn, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa.; North-Eastern Construction Co., New York, general contractor.

270 tons, miscellaneous cable supports, Boulder dam, Colorado, specifications 609, to Midwest Steel & Iron Works, Denver, through bureau of reclamation.

240 tons, I-beam bridges, Sioux county, Iowa, to Pittsburgh-Des Moines Steel Co., Des Moines.

230 tons, bridge R-67, Jackson county, Arkansas, to Virginia Bridge & Iron Co., Birmingham.

215 tons, bus garage, Lowell, Mass., to New England Structural Co., Everett, Mass.

200 tons, state bridges, Minnesota, to McClintic-Marshall Corp., Pittsburgh.

200 tons, buildings, Rhode Island state college, Kingston, R. I., to Tower Iron Works, Providence, R. I.

200 tons, state highway bridge NRH 498-B, Gainesville, Ga., to Johnson City Foundry & Machine Co., Johnson City, Tenn.

200 tons, two 20-ton cranes, specification 7857, Mare Island, Calif., to Orton Crane & Shovel Co., Chicago.

195 tons, shop building, Austin, Tex., to Austin Bros., Dallas.

175 tons, postoffice, Pecos, Tex., to Austin Bros., Dallas, Tex.

165 tons, buildings, Bonafide Mills Inc., Winthrop, Me., bulk to Belmont Iron Works, Philadelphia; Taylor-Davis Co., Philadelphia, awarded threaded reinforcing rods; Industrial Constlruction Co., Philadelphia, general contractor.

150 tons, bridge, Core creek, near Beaufort, N. C., for United States engineer, Wilmington, N. C., to Virginia Bridge & Iron Co., Roanoke, Va.; Tidewater Construction Co., Norfolk, Va., general contractor; Hall-Hodges Co., Norfolk, awarded reinforcing bars.

145 tons, building, Wilson, Jones & Co., Elizabeth, N. J., to Lafayette Iron Works, Jersey City, N. J.; through White Construction Co.

140 tons, addition, Moses Taylor hospital, Scranton, Pa., to the Anthracite Bridge Co., Scranton.

125 tons, state bridge, NRS-300-B, South Dakota, to Hassenstein Steel Co.

120 tons, state bridge NRH-794, Childress county, Texas, to North Texas Iron & Steel Co., Dallas.

100 tons, shapes and bars, Brookline station postoffice, Boston, to Lehigh Structural Steel Co., Allentown, Pa., and Morrison-Stevens Co., Boston Co., Boston; S. W. Poorvu, Boston, general contractor.

100 tons, state highway bridge, Hosford, Fla., to Bethlehem Fabricators Inc., Bethlehem, Pa.

Shape Awards Compared

	Tons
Week ended March 30	**9,140**
Week ended March 23	**54,120**
Week ended March 16	**10,179**
This week in 1934	**11,138**
Weekly average, 1934	**16,284**
Weekly average, 1935	**15,545**
Weekly average, February	**13,702**
Total to date, 1934	**242,894**
Total to date, 1935	**202,099**

Shape Contracts Pending

8000 tons, including 7500 tons steel sheet piling, pier repairs, army base, Boston; bids April 9, United States engineer, Boston.

1700 tons, fabricating and delivering,

Wheeler dam roadway bridge, Knoxville, Tenn., for Tennessee valley authority, Washington.

750 tons, grade elimination, New York New York, New Haven & Hartford railroad at Hartford, Conn.; bids April 5.

500 tons, Allegheny county, Pennsylvania, home, Woodville, Pa.

500 tons, New York Central railroad grade crossing elimination work. Utica, N. Y.; Bates & Rodgers, Chicago, low on general contract.

340 tons, state bridge, north fork, Feather river, Plumas county, California; bids April 10.

300 tons, parochial school, Middle village, Queens, New York, Chapman-Kruge Engineering Co., contractor.

230 tons, state highway bridge, Clarksburg, Mo.

200 to 250 tons, building, Western Automobile Machine Screw Co., Elyria, O.; bids being taken.

175 tons, largely junior beams, dormitory, Smith college, Northampton, Mass.; E. J. Pinney Co., Springfield, Mass., low.

154 tons, piling, bulkhead for Milwaukee harbor commission; Edward E. Gillen Co., Milwaukee, low for general contract.

140 tons, state bridge, Singac, N. J.; bids April 8.

100 tons, brew house, German Brewery Co., Cumberland, Md.; bids taken March 27.

Unstated tonnage, high school, Cumberland, Md. Readvertisement of bids for April 4. Design revised from former size estimate of 600 tons.

Reinforcing

Reinforcing Bar Prices, Page 63

Chicago—Several private projects continue to be included in reinforcing bar awards, with a larger tonnage pending for various forms of public construction. Bids have been taken on 3500 tons for the Milwaukee filter plant and on 7250 tons for the Chicago sanitary district. Bar orders continue to be placed from time to time by contractors for state highway work.

Pittsburgh—Zanesville, O., engineers will open bids this week on several small rail steel bar tonnages for the Muskingum, O., dam projects. The Baltimore & Ohio railroad has not announced the low bidder for the general contract for part of its Staten Island, N. Y., grade separation work on which it took figures March 21. Bids will be asked in the near future on the remainder of this work, which requires in total close to 4000 tons of bars. The reinforcing mesh market is inactive. The 2.05c price quoted by distributors for cut lengths of new billet bars is steady.

Cleveland—Several hundred tons of reinforcing bars were placed here during the week in small lots. The market is unsatisfactory, little work developing from public projects.

Boston—Buying is generally in small lots. Sewer projects at Hartford, Conn., require several hundred tons. Highway and bridge reinforcing requirements are sluggish for this season.

New York—Pending reinforcing steel volume is lighter. Small-lot purchasing is fairly active, but total awards are down. Bridge and highway needs are not encouraging.

San Francisco—Awards were the third largest of any week this year,

Concrete Awards Compared

	Tons
Week ended March 30	6,505
Week ended March 23	2,891
Week ended March 16	6,245
This week in 1934	12,405
Weekly average, 1934	4,084
Weekly average, 1935	5,421
Weekly average, February	5,506
Total to date, 1934	65,744
Total to date, 1935	65,479

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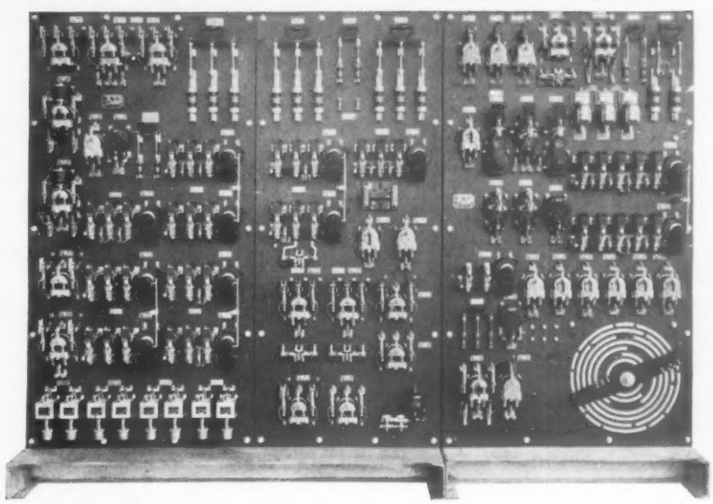

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aggregating 4738 tons and bringing the total for the year to 33,939 tons, compared with 21,262 tons in the corresponding period in 1934. The outstanding letting went to Colorado Fuel & Iron Co., Pueblo, Colo., 3580 tons for the Moffat tunnel in Colorado. Interest now centers in the opening of bids April 3 for more than 11,000 tons of bars for the Fort Peck, Mont., dam spillway.

Philadelphia—Reinforcing bar demand is negligible, with no outstanding orders reported in any quarter. Some scattered work of fair size is in prospect, but the situation as a whole is about as listless as it has been at any time. Billet steel bars, cut lengths, are 2.05c, Pittsburgh, or 2.34c, Philadelphia.

Seattle—No award larger than 100 tons was noted during the week, but considerable tonnage is pending. Reclamation bureau has not yet asked for bids for a heavy tonnage required for the Coulee, Wash., dam project. For the Laurelhurst trunk sewer job, Seattle, requiring over 100 tons, Queen City Construction Co., Seattle, is low at $232,026.

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DEEP DRAWN SHELLS AND SHAPES

Reinforcing Steel Awards

3580 tons, Moffatt tunnel, Colorado, to Colorado Fuel & Iron Co., Pueblo, Colo.

550 tons, building, Fleischmann Malting Co., Chicago, to Joseph T. Ryerson & Son Inc., Chicago.

450 tons, parcel post building, South station, Boston, to Truscon Steel Co., Youngstown, O.; through Great Lakes Construction Co., Chicago.

418 tons, state highway work in Los Angeles county, California, to unnamed interest.

200 tons, road work, Illinois, to Calumet Steel Co., Chicago.

200 tons, laundry for Milwaukee county, Wisconsin, to Concrete Steel Co., Chicago.

165 tons, Cross street school, Somerville, Mass., to Barker Steel Co., Boston.

150 tons, highway and grade separation, Westchester county, New York, to Concrete Steel Co., New York.

135 tons, including 65 tons for Babcock Hall, Wooster college, Wooster, O., and 70 tons Schaff road improvement, Cuyahoga county, Ohio, to Truscon Steel Co., Youngstown, O.

132 tons, Guadalupe dam, San Jose, Calif., to unnamed interest.

125 tons, office building, 1662 North Highland avenue, Los Angeles to unnamed interest.

100 tons, state highway work in four counties in California, to unnamed interest.

100 tons, building, Telling Belle Vernon Co., Cleveland, to Patterson-Leitch Co., Cleveland.

Reinforcing Steel Pending

3500 tons, filter plant, Milwaukee; Kramp Construction Co., Berlin, Wis., low for general contract.

650 tons, sewage plant, Stickney, Ill.; Herlihy, Mid-Continent Co., Chicago, low.

135 tons, outfall sewer, Hartford, Conn., A. I. Savin Construction Co., East Hartford, contractor.

Wire

Wire Prices, Page 63

Pittsburgh—The last week in March showed fair improvement in orders for wire products. Prices remain at 2.30c, Pittsburgh, on plain manufacturing wire and $2.60 per keg on nails. Woven wire fencing remains $63 per base column, polished staples, 3.30c, and galvanized barbed wire, 3.00c, with annealed fence wire, 2.45c.

Cleveland—Demand for wire and wire products has improved and now is more in line with the usual trend at this time of the year. A considerable volume of business was booked here during the week from jobbers, especially for products required for farm rehabilitation. Specifications due to automobile requirements are in fairly steady volume.

Chicago—Large mail order houses, contrary to recent reports, have not reduced prices on wire products, such as plain wire, barbed wire, fencing and nails. Current catalogs show

some prices higher than those in the preceding issue. Standard wire nails are 10 cents per 100-pound keg higher, at $3.10, Chicago or Cleveland base, and polished staples the same advance, to $3.55. Galvanized fence wire is unchanged. Producer carlot prices on standard brands in 100-pound spools is $3.15, Chicago, and $3.00, Cleveland, and the mail order price on 12½ gage two or four-point cattle barbed wire is about $3.17 per hundred pounds at those points. Producers apply a 10-cent differential on pool lots or less car loads. Fencing prices are not changed but the mail order houses are offering a light No. 14½-gage fencing at a low price.

Demand for manufacturers' wire lately has been fairly steady, though tapering in automotive needs is in prospect. Forward buying of manufacturers' wire involves relatively small lots.

Boston—Specialties and wire going into manufactured consumer goods are holding close to the recent demand, but other finishing departments are less active. Imports of wire rods have increased recently, notably from Sweden.

Cold Finished

Cold Finished Prices, Page 63

Pittsburgh—Leading producers of cold-finished carbon steel bars have made no deviation from the present market of 2.10c, base Pittsburgh, for 10,000 to 19,999-pound lots. Full observance is made of other basing points at 2.15c, Cleveland or Gary, Ind.; 2.20c, Buffalo; 2.30c, Detroit; and 2.35c, eastern Michigan. Recent announcement that a small nonintegrated producer of cold-finished bars in Detroit had cut its price $3 a ton, related to its nearest basing point, which is Cleveland, has not been of sufficient import to seriously disturb the major portion of the market.

New York—Several new prices on tool steel will become effective April 1 at Bethlehem, Pa. These include 13c on carbon blade sheets (cutlery steel), carbon 0.85 to 1.20 and manganese 0.25 to 0.40; 8c on back spring sheets, carbon 0.60 to 0.95 and manganese 0.30 to 0.45; and 6.75c on spring steel sheets, open-hearth quality.

Also, under the general subclassification of saw steel sheets, of 6.50c, open-hearth carbon steel; 10.50c, electric chrome nickel steel (chrome under 0.60, nickel under 1.00); 11c, electric chrome nickel steel (chrome under 0.60 and nickel 1.00 to 1.50); 5½c, open-hearth carbon steel sheets for hand saws; 10.50c, electric chrome nickel steel for hand saws (chrome under 0.60 and nickel 1.00 to 1.50); and 13.50c, electric chrome nickel steel for crosscuts (chrome under 0.60, nickel 1.00 to 1.50).

Under general sub-classification of saw steel circles, 7.50c, open-hearth carbon steel of best quality; 9.50c, electric carbon steel; 12c, electric chrome nickel steel (chrome under 0.60, nickel under 1.00); 12.50c, electric chrome steel (chrome under 0.60 and nickel 1.00 to 1.50); and 21c, electric chrome tungsten steel (chrome 0.25, tungsten 1.00).

Iron Ore

Iron Ore Prices, Page 65

Cleveland—Consumers of Lake Superior iron ore are preparing estimates of requirements for this season, but have not specified tonnages, and no important inquiries have appeared. The Ford Motor Co., which buys the largest tonnage in the open market, is a little later than usual with its inquiry. Last year it purchased 275,000 tons and probably will buy more than this amount this year. Base prices, steady for six

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years, have not been determined. The reported sale of Adirondack iron ore into the lakes area concerns a small all-rail shipment from Port Henry, N. Y., to a Youngstown consumer. This is an open-hearth "fix", or lump ore, and occasional sales to the Pittsburgh and Youngstown districts are not unusual, though the bulk of such ore used by producers of basic open-hearth steel there comes from the Lake Superior district.

New York—Foreign ores are stronger, with North African and Swedish low phosphorus up ½-cent to 10c per unit, f.a.s., port.

Metallurgical Coke

Coke Prices, Page 63

On beehive furnace coke $3.85, Connellsville, Pa., for spot shipment has virtually disappeared, and while $3.60 is being done on some business, down to $3.40 has been reported. A more stable situation exists in beehive foundry coke where $4.60 is more uniformly quoted. On premium beehive foundry coke the market appears to be $5.10 per ton.

An example of inequalities worked by the present coal situation is in the present market on crushed furnace coke, which is selling for around $3.40, against a nominal $3.60 market on standard furnace coke.

Deliveries of foundry coke in the Chicago district in March were about 5 per cent over February, the largest in nearly five years. No shortage is threatened in case the coal strike develops. The price for by-product foundry coke has been extended into April at $8.50, ovens, for outside delivery, and $9.25, delivered, Chicago. Users in the St. Louis district have been stocking coke against strike shortage and shipments have been heavier than consumption. Cincinnati suppliers have reaffirmed the price on by-product coke for April at $9.30, delivered.

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Pig Iron

Pig Iron Prices, Page 64

Pittsburgh — Addition of a third merchant furnace to the active list in this district was promised last week with announcement the RFC had granted a $350,000 loan to the Struthers Iron & Steel Co., Struthers, O., for repairs to its Anna furnace, idle since early 1930. It is reported in the trade the Struthers furnace has promise of resuming on a hot-metal contract for a Valley steelmaker. Current pig iron requirements are generally inactive and the former practice of making quarterly contracts, expected at this time, has practically disappeared. On a Pittsburgh district furnace basis, the market is quoted $18 per ton for basic iron, $18.50 for foundry and $19 on bessemer.

Cleveland—Sales were lighter during the week, one merchant furnace interest booking 6000 tons, compared with 10,000 tons in the preceding week. Scrap price reductions are affecting pig iron sales, and the supply is so large that pig iron producers doubt whether even a reduction in their prices would lead to much heavier consumption. A fair average of scrap consumption today is said to be 60 to 65 per cent of the foundry charge, or 25 to 35 per cent more than five years ago. It is not uncommon for some foundries to operate with a 90 per cent scrap mixture, and in one instance a melter is charging 100 pounds of pig iron to 2000 pounds of scrap. Nevertheless, pig iron shipments during March were 25 per cent heavier than in February.

The automobile industry has not stocked castings, and producers expect shipments to continue in large volume for some weeks.

Chicago — March pig iron shipments were slightly ahead of the February volume and extended the number of consecutive months in which deliveries have increased to eight. New business for second quarter delivery has continued heavier than that received for first quarter shipment, indicating maintenance of foundry operations at the recent rate during at least the early part of the new quarter. Schedules of automotive foundries, an important factor in increasing the total melt, are expected to taper soon, but farm implement manufacturers are in a favorable position to better previous schedules during the next three months. For General Steel Castings Corp.'s Granite City, Ill., foundry, 10,000 tons of basic is pending.

Boston—Small orders for pig iron predominate and the demand is far from active. Prices are unchanged with some shading on one brand of foreign iron which is moving from stock in Rhode Island.

New York—Pig iron business remains spotty, with orders light. A notable exception, however, is a lot of 2600 tons of low-phosphorus English iron purchased here for a plant in Baltimore. Talk of an early resumption in operations at Troy, N. Y., has been dispelled by reliable information that this furnace will not blow in for several months, possibly not this year.

Philadelphia — Pig iron shipments for March will be about on a parity with the daily rate for February. Some sellers report slightly less tonnage, while others see some gain. The month as a whole, however, has been generally disappointing to sellers.

Buffalo — March maintained the shipment rate of February but produced little forward buying. Consumers are purchasing for prompt shipment only and few have covered for the second quarter. First production of iron in a second stack of the Hanna Furnace Co. here is scheduled for this week.

Cincinnati — Considerable contracting for second quarter pig iron needs has been done in this district. However, some melters prefer to order often, in small lots, and this business is on an even level at about 800 tons weekly.

St. Louis — In the past week a slowing down in pig iron activities has reflected a drop in operations of certain melters. Despite this recession, preliminary reports indicate March shipments will show a moderate increase over the February total. Jobbing foundries report a decline in new business placed since mid-March. Farm implement interests are still active.

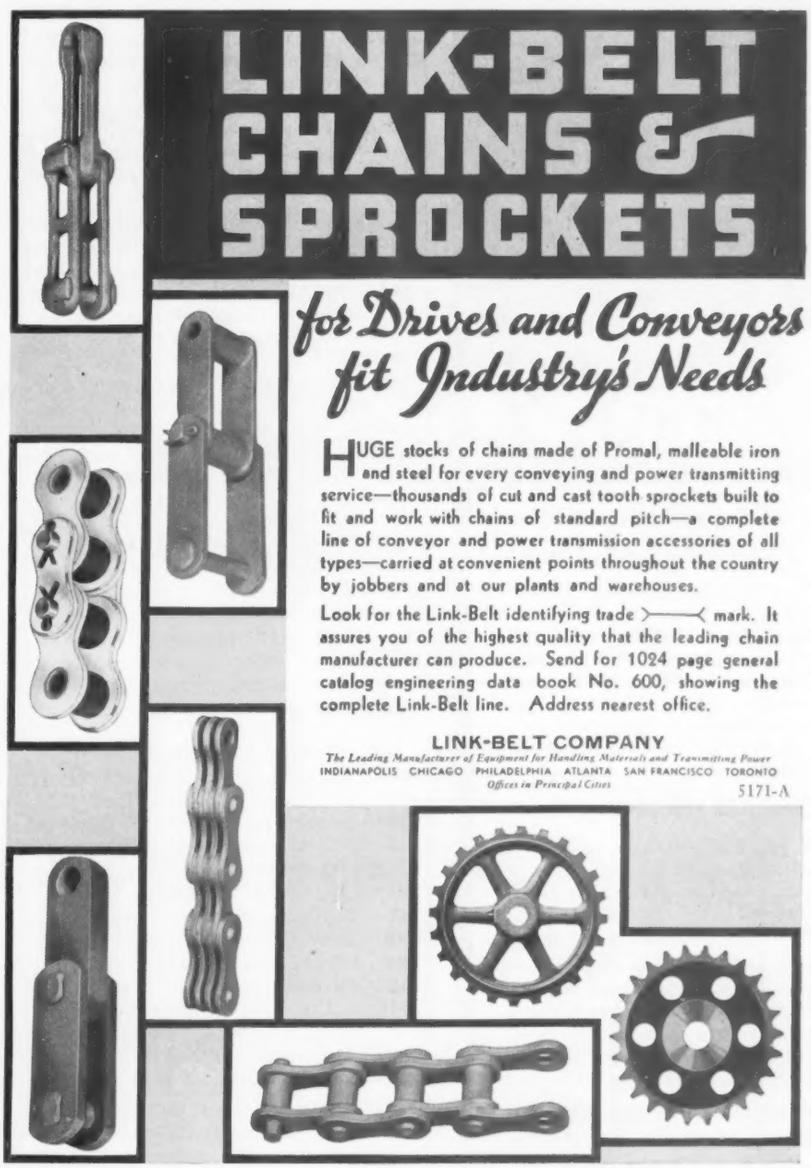
Birmingham, Ala.—The pig iron market is quiet with little buoyancy apparent. Some spot shipments still are being made.

Refractories

Refractories Prices, Page 64

Second quarter refractory brick prices have been announced unchanged on the following basis, f.o.b. works: Fire clay brick, first quality, $45 per 1000; second quality (except Ohio) $40 per 1000; silica brick, $45 per 1000, Pennsylvania works, with chrome basic brick, $45 per ton and magnesite brick, $65 per ton.

Ford Motor Co. has placed an order for a complete relining of one of its Dearborn, Mich., blast furnaces which was built in 1917 and last relined about nine years ago. Other recent refractory contracts have included repatching a Great Lakes Steel Corp. blast furnace at Detroit, and relinings on the Davison Coke & Iron Co.'s Neville Island, Pa., stack and a Hanna Furnace Corp. stack at Buffalo.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Scrap

Scrap Prices, Page 65

Pittsburgh — A weak market of some six weeks' duration was arrested last week when a district mill purchased about 5000 tons of No. 1 heavy melting steel, paying $12.25 per ton, delivered. Thereby the market advanced 25 cents a ton and No. 1 heavy melting steel became quotable at $12 to $12.50. Several suspensions on shipments by district buyers have been lifted. The Pennsylvania railroad is selling 5850 tons of No. 1 heavy melting steel, 5405 tons of No. 3 and No. 4 scrap rails and 2150 tons of iron car wheels, April 3.

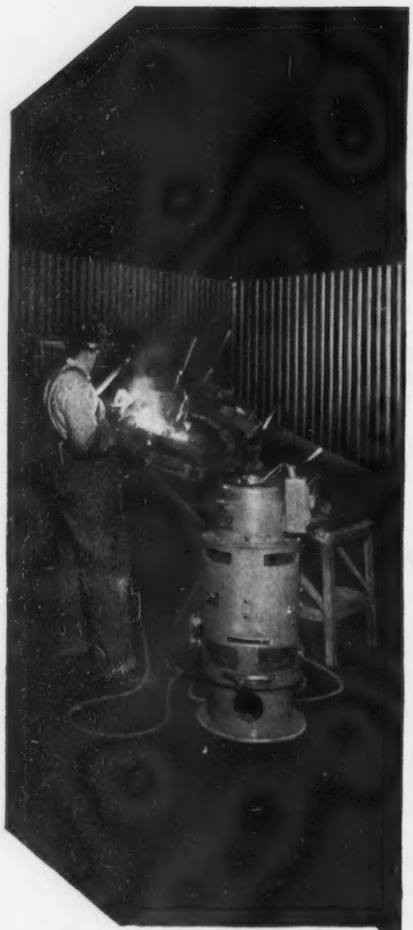
Cleveland—End of the present downward movement in demand and prices of steel and iron scrap seems to be near and the situation is more cheerful. Shipments on orders are steady here and in the valley. Some adjustments of price have been made to meet changes in competing districts.

Chicago — Scrap is slightly easier and some sellers indicate willingness to accept orders for heavy melting steel at $10.25, compared with the previous mill purchase at $10.50. Railroad heavy melting steel has brought around $10.25, delivered. Most consumers defer placing orders and prices on a number of scrap grades are nominal. Compressed sheets, borings and turnings and No. 1 busheling are quoted lower.

Boston—Scrap prices are steadier, the weakening trend on several grades having halted. Recent price declines have not, however, been recovered. Forge fire scrap is down 25 cents a ton. Domestic buying is light. Export business is less settled and somewhat below recent volume, with dealers paying unchanged prices for heavy melting steel at docks.

New York—The downward trend in scrap prices is less pronounced, turnings being an exception, that grade weakening again 25 cents a ton. Others are steadier, but have made recovery from recent losses. Volume is light. Domestic consumers are taking small shipments only and export activity is less than several weeks ago. Union Shipbuilding Co., Baltimore, has bought the hulk of the MORRO CASTLE at $33,605 for dismantling to be sold as scrap. Dealers estimate there is 12,000 tons of scrap in the ill-fated ship.

Philadelphia — Although reductions have been made in two or three minor grades, the general tone of the local scrap market is firmer. No. 2 steel for export is not coming out as freely as expected at the recent reduction and one local buyer of this



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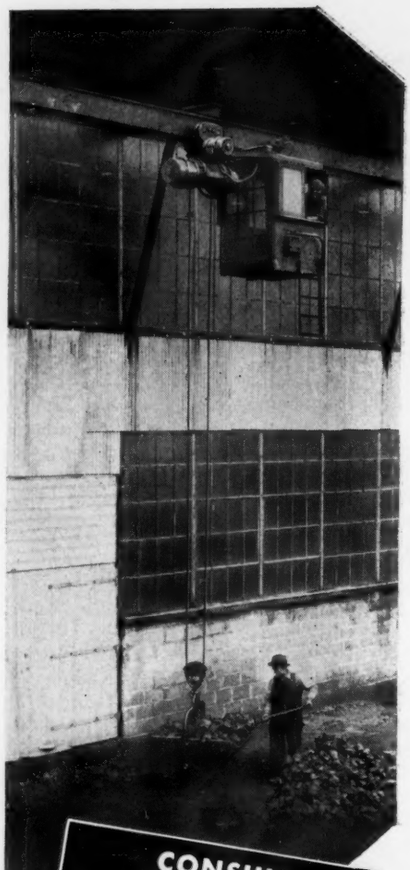

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material has been forced to raise his offerings slightly. Greater disposition is noted among buyers of railroad malleable to demand material free of journal boxes, and they are willing in some cases to pay premiums 50 to 75 cents for malleable which does not include these boxes.

Buffalo—Scrap trading in tonnage has almost ceased. Consumers, content with their supplies and hopeful that arrival of water-borne tonnage will still further lower prices, are marking time. Dealers are making shipments on contracts and selling little additional tonnage. Prices are lower with the list off $1 to $1.50 from recent quotations in many grades.

Detroit—After making a stand at reduced levels the past three weeks, iron and steel scrap prices generally eased 50 cents last week, cast forge flashings, stove plate and machine shop turnings being the only exceptions. This puts steel at $7.50 to $8 and hydraulic compressed sheets at $7.75 to $8.25. An increasing supply of scrap has emanated from automobile plants; mills have submitted no demands; prices inevitably weakened.

Cincinnati—The iron and steel scrap market, in absence of new tonnage buying, is listless. Prices are unchanged but nominal. Shipments against contracts are in fair volume.

St. Louis—There has been no halt in the declining tendencies of scrap iron and steel. Except 3000 to 4000 tons of heavy melting steel sold to an east side mill, purchasing by melters generally has been light. The round tonnage taken by the east side interest was at prevailing quotations, which, incidentally, are the low point on the present downward movement.

Birmingham, Ala.—The scrap market is unchanged. Supply is ample of scrap remains equal to the demands made upon it.

Seattle—The export market for scrap is weak, shippers striving to hold present prices at $9.25 for No. 1 melting and $10.75 for rails. However, these prices have not been tested as the Orient is temporarily not buying.

Ferroalloys

Ferroalloy Prices, Page 64

New York—Ferromanganese sellers are looking for some gain in specifications in April. For the past month the trend has been downward. The market is unchanged at $85, duty paid, Atlantic and Gulf ports. Spiegeleisen specifications also have tapered in recent weeks. Domestic spiegeleisen, 19 to 21 per cent, is $26, Palmerton, Pa., for quantities up to 50 tons and $24 on 50-ton lots and over.

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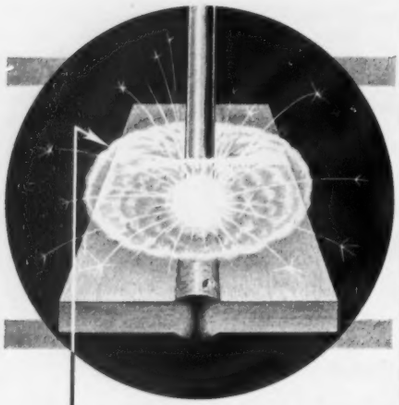

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Warehouse

Warehouse Prices, Page 66

Cleveland—March warehouse tonnage in this district was 10 per cent less than that for February. Last week business showed a further shrinkage. Consumers give unsettled labor conditions and government policies as reasons for retrenchment. Orders reaching warehouses are small and generally for rush shipment, buyers in nearby areas taking advantage of over-night commercial truck deliveries, calling for night service at warehouses. Prices are steady.

Pittsburgh — March was disappointing to jobbers as it only equaled the February rate, whereas March usually is the best month in first quarter. Except for possible changes in mill supply house prices on soft steel bars, warehouse prices of steel products are unchanged.

Chicago—Sales are fairly steady and March will show a small gain over February but the daily average of sales is off slightly since a month ago.

Boston—Sales volume with most warehouses in March was below expectations. Prices are unchanged, but imported steel is an increasing factor.

New York—With most jobbers March sales exceeded February with encouraging volume in the final week. Buying is well spread with a larger number of diversified orders. Some jobbers have strengthened quotations slightly on bolts and nuts but prices on these are weak and unsettled.

Philadelphia — Warehouse trading has recently shown some improvement. Whether it will be sufficient, however, to raise the daily rate above that for February is still a question. Prices are unchanged.

Detroit—Iron and steel warehouses expect to benefit, in mild fashion, shortly from the placing of some additional business by automobile manufacturers with tool and die shops. Actual sales last week were little changed and prices are steady.

Cincinnati — Warehouse sales during March showed a small increase over January and February. The market remains featureless, a broad industrial demand sustaining volume.

St. Louis—A moderate improvement is noted in buying from a variety of sources. Wire and wire products are moving in larger volume, with barbed wire making a particularly favorable showing.

San Francisco—Most distributors report a better volume of business than a year ago. Private buying has increased. Some changes have recently been made in prices on the coast.

Seattle—Warehouse business is ahead of last month, which was the best for February in three years. Tonnages are small as a rule, although some carload lots have been sold lately.

Nonferrous Metals

Nonferrous Metal Prices, Page 64

New York—A definite upward trend in most nonferrous metal prices was evident last week. Lead advanced $1 a ton, Straits tin rose from the previous week's level of around 45.50c to well above 47.00c and export copper jumped to around 7.35c, c.i.f. European ports.

Copper—World producers agreed to curtail output abroad 240,000 tons annually and to bring production more in line with consumption. It was stated that the plan would permit ample supplies but would prevent the accumulation of excessive stocks. Sales in the domestic market were irregular but it is believed that the total for the month will approximate the normal monthly book of 30,750 tons.

Lead—Following active demand the price was advanced Thursday to 3.50c, East St. Louis, and 3.65c, New York, with St. Joseph Lead continuing to ask $1 a ton premium on the eastern market. Buying was well diversified among consumers.

Zinc—Prime western prices held remarkably firm at 3.90c, East St. Louis, in fact of light demand for nearby delivery.

Tin—Supported by recoveries in the London market and higher exchange rates on the pound sterling Straits tin prices were stronger at well over 47.00c on spot. Buying was light and spotty.

Antimony—Prices held unchanged in a quiet market.

Aluminum—Virgin metal was still available at 19.00c to 21.00c, delivered, for ninety-nine per cent plus. No. 12 secondary ingot was easier and quoted 15.75c to 17.00c, delivered.

Steel in Europe

Foreign Steel Prices, Page 66

London — (*By Cable*)—New demand for pig iron in Great Britain is light, but underlying market conditions are satisfactory. Completion of a trade pact with Italy raises hope of better exports to that country. Steel ship yards in Scotland are fairly busy. Domestic demand for steel sheets is active, but sheet exports are dull. The steel industry generally is busy on orders already

booked, but further buying is needed.

France and Belgium report that the increased British duties on steel imports, and current weakness of the belga, are seriously affecting their trade. Germany continues to conduct a substantial barter trade.

Increase from 33 1/3 to 50 per cent in duties on steel and iron products imported into Great Britain, as reported in STEEL, March 25, appears to be a defensive measure to protect against a flood of imports if Belgium and other countries should go off the gold standard. Under the new rates tariff classifications have been changed, and specific or alternative ad valorem duties established, between 33 1/3 and 50 per cent on an ad valorem basis.

Frederick D. Grab, commercial attache at London, reports to the department of commerce, Washington, some of the new rates, as follows: Blooms, billets and slabs valued up to £4 per ton will be dutiable at £2 per ton, and on the same products from £4 to £7 10s per ton at £2 10s per ton, and on values over £4 and up to £9 per ton the new rate will be £3 per ton on angles, shapes and sections valued up to £7 per ton the duty will be £3 per ton, and from £7 to £15 per ton the rate will be £4 per ton, or 33 1/3 per cent ad valorem, whichever is the greater.

Girders, beams, joists and pillars will be taxed £3 per ton or 33 1/3 per cent ad valorem, whichever is the greater; hoop and strip up to £7 per ton will be dutiable at £3 per ton, and on values over £7 and not exceeding £15 per ton the rate will be £4 per ton or 33 1/3 per cent, whichever is the greater. Steel rails are reclassified and in place of the former duty of 20 per cent they will be dutiable at £3 per ton or 33 1/3 per cent, whichever is the higher is the higher. These rates do not apply to imports from Empire sources.

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Ferrocolumbium now is being produced commercially by the Electro Metallurgical Co., and is being marketed by the Electro Metallurgical Sales Corp., 30 East Forty-second street, New York. The new ferroalloy contains 50 to 55 per cent columbium and the price is $3, delivered, per pound of contained columbium. Ferrocolumbium is intended for use principally as an inhibitor of intergranular corrosion in stainless steel of the 18-8 chrome nickel type. Stainless steel with a

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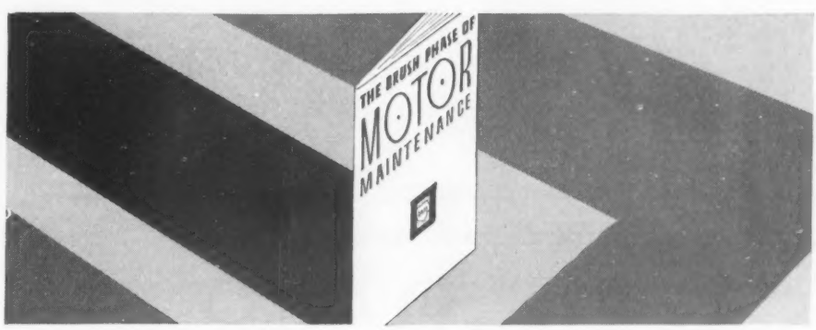

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columbium content approximately 10 times the carbon content, it is found, can be welded without subsequent annealing for high temperature service at 1000 to 1500 degrees Fahr.

Harnischfeger Corp., Milwaukee, has introduced a midget excavator unit, crawler type, with ⅜-yard shovel, weighing 15,800 pounds. It is powered optionally with diesel or Ford engine. It is all-welded and has speed of 1½ to 3 miles per hour.

Labor Aids Attack On Wagner Bill

(*Concluded from Page* 11)

liam Westlake, the employes representative in connection with his testimony of methods which had been employed by trade unions in attempting unsuccessfully to enforce union membership within the plant.

"It is not surprising that our employes have shown a preference for our employe representation plan," he commented.

E. W. Jenkins, representing labor at the Carnegie Steel Co. plant at Youngstown, O., and Louis E. Haht, representative of the workers at the Acme Steel Co., Chicago, both contended the Wagner bill would invite conflicts within their plants and cripple their employe representation plans and instill ill feeling between the management and employes.

Martin Murphy, spokesman for the labor group of the Republic Steel Corp., Youngstown, told the committee:

"We are opposed to any legislation which is going to interfere with the present satisfactory system of collective bargaining."

Albert Crew, spokesman for the labor delegation from the Bethlehem Steel Co. plant at Sparrows Point, Md., told the committee it was being "misled" by trade unions as to what workers really desired. He argued the legislation would "obstruct the progress" of the representation plan of which he and his fellow workers are members.

Others Re-echo Sentiments

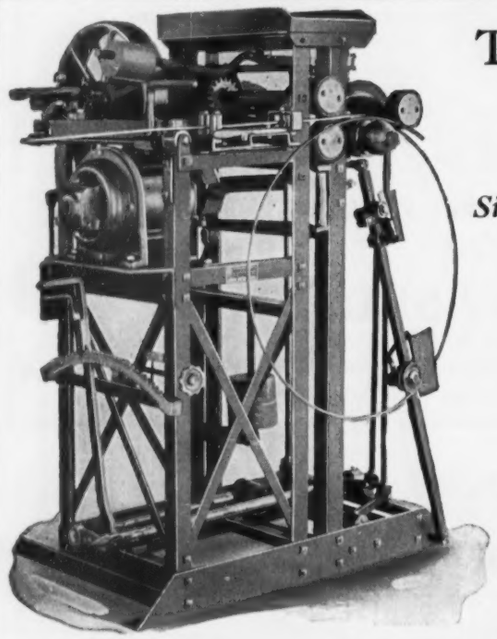
Other representatives of labor included R. F. Colley, for employes at the Butler, Pa., works of the American Rolling Mill Co.; Jack Larkin, for the Weirton Steel Co., Weirton, W. Va.; Guy E. Mitchell, for the Wheeling Steel Corp., Steubenville, O.; Charles Davis, for Spang, Chalfant & Co., Etna, Pa.—by no means mentioning all present.

Also making a deep impression, and typical of the resentment of labor in other industries than iron, steel and metalworking, was the appearance of Thomas B. Conway, of Toledo, O., speaking for 10,000 employes of the American Telephone & Telegraph Co. He specifically objected to the provision prohibiting the company from contributing financially to employe plans.

R. W. Dunbar, of Worcester, Mass., representing the Norton Co., told the committee the "hard-headed thinking workers do not want to become embroiled in outside organizations which are more interested in increasing their membership than in keeping a free and steady flow of production."

Wendell Whipp, of the Sydney Machine Tool Co., Sydney, O., termed the bill "an effective wedge to widen the narrow range betwen employers and employes." He especially criticized the bill's restrictions on the activities of employers and its lack of limitations on employes.

In addition to these witnesses, the United States Steel Corp. and the Bethlehem Steel Corp. filed briefs with the committee.



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Activities of Steel Users and Makers

KOPPERS CONSTRUCTION CO., Koppers building, Pittsburgh, will move its New York office May 1 to the Stone & Webster building, 90 Broad street.

* * *

B. E. Schonthal & Co. Inc., Chicago, dealer in steel products and mining equipment, has moved its offices to suite 1300, Steger building, 28 East Jackson boulevard.

* * *

Republic Steel Corp., Youngstown, O., has moved its district sales office at Seattle to the White-Henry-Stuart building. C. D. Winter continues in charge as district sales manager, assisted by his present staff, to which is added Archie Rider, recently transferred from the Youngstown office.

* * *

Benjamin Electric Mfg. Co., Desplaines, Ill., has purchased a second 6 x 12-foot gas-fired porcelain enameling furnace from the Ferro Enamel Corp., Cleveland, a duplicate of one installed four months ago. It is equipped with full alundum V-bottom muffle and automatically-controlled gas burners. Charging equipment will consist of two American-Ferro unloaders. The Ferro Enamel Corp. is rebuilding two 5 x 12-foot box type furnaces at the Lorain, O., plant of the American Stove Co., St. Louis. Surface combustion gas burners have been installed in each furnace, with full alundum V-bottom muffles.

Equipment

Pittsburgh—Jones & Laughlin Steel Corp. has placed an additional order in connection with its blooming mill extension to the South Side works, involving a large shear, to be supplied by Mackintosh-Hemphill Co. here. Contract is valued at approximately $150,000. Patent controversies now pending in both Chicago and Philadelphia courts over four-high mill patent legalities are reported indirectly holding up the award of American Sheet & Tin Plate Co.'s new continuous mill for Gary, Ind., as well as that of National Steel Corp., in the latter's Great Lakes Steel Corp. division at Ecorse, Mich.

Boston—Several substantial machinery contracts have been placed with New England shops, government awards included in the openings early in March. This business, with that previously booked, gives some of the larger shops good backlogs. Inquiry and buying from private industry has slackened. Textile machinery builders are adversely influenced by declining sentiment in the textile industry.

Chicago—Hesitancy in placing of orders for heavy machinery and equipment is in contrast to steady demand for small tools. At the same time inquiries for machine tools and other types of equipment are well maintained and a number of metal-working plants are considering purchases of new machinery. Uncertainty over the general business outlook usually is given as a reason for deferring the placing of orders.

Seattle—Maj. C. F. Williams, army engineer, Portland, Oreg., has called bids April 5 for two turbines, 60,000-horsepower each, one 5000-horsepower turbine, and governing equipment for the Bonneville power house, now building. This is the third inquiry, previous bids having been rejected. Bids will be opened at Juneau, Alaska, April 15, for two engine compressors and two complete sets for the lighthouse service. Seward, Alaska, plans a 1000-horsepower hydroelectric plant, costing $118,000, subject to federal aid.

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Construction and Enterprise

New York

NEW YORK—A. M. Alton Inc. has been formed to manufacture grinding wheels and machinery, by Irvin L. Freeman, 233 Broadway.

NEW YORK—Thypin Steel Corp. has been incorporated to deal in metals, metal scrap and metal fabricating, by Sally Friedfeld, Samuel W. Siegel and Maurice Plager. Papers were filed by Henry G. Littau, 521 Fifth avenue.

NEW YORK—Universal Bronze & Steel Door Co. Inc. has been incorporated to manufacture fireproof or kalamein doors, by Morris Shapiro, 320 Broadway.

NIAGARA FALLS, N. Y.—Bids for construction of a new intake for the Niagara Falls filtration plant will be received April 4. Cost is estimated at $140,000.

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PITTSBURGH TOOL STEEL WIRE CO.
MONACA, PA.

New Jersey

ALLENWOOD, N. J.—Wilsonite Products Inc. has been incorporated to deal in iron and manganese. Fred Wilson, agent.

NEWARK, N. J.—Wheelock Lovejoy & Co. Inc. has leased the rear portion of the building at 326 Frelinghuysen avenue for the warehousing and distributing of alloy and special steels.

Pennsylvania

MILTON, PA.—Milton Steel & Supply Co is constructing a new plant and office. The shop building will be of steel construction, 40 x 80 feet, and will be equipped with the latest type of machinery for the fabrication of steel products. John G. Turpie is president.

PITTSBURGH—American Sheet & Tin Plate Co., Frick building, a subsidiary of the United States Steel Corp., is reported to be drawing plans for a continuous sheet-strip mill for its plant at Gary, Ind. Considerable auxiliary equipment may be purchased.

PITTSBURGH—American Oil Co., American building, Baltimore, recently purchased a large tract on the Monongahela river near Becks Run, close to Pittsburgh. Plans are being considered for the construction of storage tanks at this river landing, as well as a fleet of gasoline and cargo barges.

PHILADELPHIA—Bureau of supplies and accounts, navy department, Washington, will take bids April 2, schedule 4555, one motor-driven, vertical, four spindle, sensitive drilling machine; schedule 4557, one motor-driven, two spindle, high speed, sensitive drilling machine; schedule 4565, one motor-driven precision jig borer machine; schedule 4559, one motor-driven straight bevel gear generator machine; schedule 4570, one motor-driven straightening press machine; schedule 4571, 14 motor-driven, bench type grinders; schedule 4572, one four motor-driven type drilling machine; schedule 4577, one motor-driven, vertical, single spindle, drilling machine; schedule 4578, two motor-driven, high speed, sensitive, floor type, vertical, single spindle drilling machines, all for delivery at Philadelphia.

Ohio

AKRON, O.—Portage Paper Box Co., 482 South High street, suffered fire damages to its plant, including loss of machinery.

CINCINNATI—G. & G. Mfg. Co., dealer in metal products, has purchased a building at the southwest corner of Spring Grove avenue and Alfred street. It formerly was located at 2112 Colerain avenue.

GARFIELD HEIGHTS (Cleveland), O.—Town, Mayor Martin L. O'Donnell, is planning to construct a waterworks to cost about $139,000. Present plans provide for the issuing of a franchise to the Garfield Heights Water Co. for the building of the plant.

STRUTHERS, O.—Struthers Iron & Steel Co. has been allotted $350,000 RFC loan for rehabilitating the Anna furnace, which is expected to resume operations early in May.

Michigan

ALLEGAN, MICH.—L. Perrigo Co., chemist manufacturer, has private plans completed for an addition to its plant.

DETROIT — Reproductions Inc.,

(*Please turn to Page* 84)

STATISTICS OF IRON AND STEEL INDUSTRY

From department of commerce except shipments by U. S. Steel Corp., foundry equipment by Foundry Equipment Manufacturers association, river traffic by U. S. engineers at Pittsburgh, electric power by geological survey

U. S. Steel Corp.

	Automobiles			Shipments	Fabricated Shapes		Fabricated Plates			Foundry Equipment Order Index†
	Production —United States—			To consumers only, inter-company shipments not included	75-80 Per Cent of Industry Reporting			Net Tons Bookings Oil Storage Tanks		
1933	Total*	Passenger cars	Canada	Tons	Net Tons Bookings	Net Tons Shipments	Total		Miscellaneous	
Year	1,920,057	1,573,512	65,924	5,805,235	757,530	700,373	199,031	55,025	119,569	....
1934										
Jan.	156,907	113,652	6,904	331,777	74,358	46,774	15,897	3,754	10,512	37.2
Feb.	231,707	187,666	8,571	385,500	60,036	38,101	14,641	2,476	10,452	65.8
Mar.	331,263	274,738	14,180	588,209	82,250	50,685	38,924	2,202	33,806	75.4
April	354,745	289,031	18,363	643,009	98,383	66,782	20,085	2,998	13,447	67.8
May	331,652	273,765	20,161	745,063	62,391	82,735	21,891	8,746	10,802	66.3
June	308,065	261,852	13,905	985,337	97,390	81,877	27,395	11,019	13,642	70.4
July	266,576	223,868	11,114	369,938	57,234	80,326	12,523	2,028	7,901	50.7
August	234,810	183,500	9,904	378,023	73,559	95,864	16,293	3,334	10,855	43.1
Sept.	168,871	123,909	5,579	370,306	48,701	80,869	15,108	3,445	8,218	46.4
Oct.	132,491	84,503	3,780	343,962	51,002	97,853	16,581	927	12,557	55.3
Nov.	78,465	45,556	1,697	366,119	71,115	88,006	16,629	3,252	10,252	80.4
Dec.	183,187	128,059	2,732	418,630	50,720	69,911	26,025	5,185	15,318	66.9
Year	2,778,739	2,190,099	116,890	5,925,873	827,139	879,783	241,992	49,366	157,762	....
1935										
Jan.	292,765	229,199	10,607	534,055	44,686	68,759	18,778	1,389	15,310	86.6
Feb.	340,544	278,150	18,114	583,157	.....	.....	.....	.....	.....	74.2
2 Mo.	633,309	507,349	28,721	1,117,212	.....	.....	.....	.....	.....	....

*Difference of total and passenger cars equals number of trucks. †Average monthly shipments, 1922-23-24 taken as 100.

	Malleable Castings			Steel Castings		Mech. Stokers		Steel Furniture		Babbitt Metal	
	Net Tons			Net Tons		—Sales—		Dollars		Pounds 000 omitted	
1933	Output	Shipments	Orders booked	Total bookings	Total production	Fire tube boilers	Water tube boilers	Business shipments	Shelving, shipments	(a) Total Production	(b) Sales
Year	268,617	256,419	258,082	280,231	277,678	1,231	421	7,697,125	1,870,318	22,812	17,876
1934											
Jan.	30,417	26,642	32,501	26,296	27,644	117	23	993,473	210,205	2,256	1,838
Feb.	33,939	31,412	36,594	35,698	28,526	52	25	894,076	279,391	2,147	1,715
March	43,438	41,530	42,961	60,044	39,475	65	44	955,633	394,371	2,474	1,976
April	40,742	39,817	38,453	63,142	46,242	50	40	934,097	346,403	2,527	1,964
May	37,165	39,493	32,639	46,831	57,313	115	35	1,010,528	288,446	2,425	1,889
June	28,340	31,607	24,499	41,537	50,268	120	52	1,045,539	354,050	2,261	1,618
July	23,388	27,591	21,862	41,822	46,182	131	69	863,439	230,821	1,988	1,435
August	23,910	25,784	21,306	25,538	43,748	191	50	1,101,469	225,811	1,856	1,399
Sept.	21,541	20,360	19,511	20,030	31,816	248	39	879,243	260,545	1,653	1,273
Oct.	25,317	21,683	18,785	24,327	29,142	248	44	997,859	223,769	1,807	1,364
Nov.	28,515	21,615	28,530	21,552	25,799	180	25	1,038,951	216,704	1,725	1,327
Dec.	32,746	29,593	36,505	27,312	23,916	137	30	1,090,171	207,883	2,163	1,622
Year	369,458	357,127	354,146	434,131	450,087	1,654	476	11,807,843	3,243,636	25,287	19,425
1935											
Jan.	43,400	41,182	44,568	32,349	29,035	103	36	1,139,497	244,759	2,400	1,992
Feb.	.....	.....	.....	.....	.....	68	37	1,064,219	251,054	2,138	1,677
2 Mo.	.....	.....	.....	.....	.....	171	73	2,203,716	495,813	4,539	3,670

(a) by 40 plants. (b) by 30 manufacturers who produce for sale, including 5 who also report consumption of own metal.

	Coke		Electric Power	Steel Barrels		River Traffic			Steel Boilers		
	Net Tons Production		Millions Kilowatt Hours	Units		Net Tons			New Orders		
1933	By-Product	Beehive	Production*	Production	Shipments	Allegheny	Monongahela	Ohio	Total	Units Stationary	Marine
Year	26,722,400	829,500	85,260	6,571,581	6,560,258	31,007	467,841	509,011	4,118	3,920	198
1934											
Jan.	2,475,785	107,900	7,631	708,086	706,209	590	27,158	54,109	249	239	10
Feb.	2,493,494	129,100	7,049	573,391	572,915	520	12,429	4,373	212	198	14
March	2,968,573	161,400	7,717	695,681	703,101	2,180	40,685	47,897	294	283	11
April	2,875,451	71,600	7,443	657,185	658,216	5,100	51,995	72,974	380	361	19
May	3,191,869	63,200	7,683	494,051	489,186	3,050	72,922	73,361	304	294	10
June	2,989,875	61,100	7,472	701,826	696,349	10,195	54,913	83,718	415	402	13
July	2,381,459	50,700	7,605	598,745	608,644	2,950	41,231	60,005	455	452	6
August	2,279,672	43,700	7,710	361,852	364,081	2,015	32,412	45,840	597	584	13
Sept.	2,174,771	54,800	7,206	412,592	417,114	3,750	35,411	45,848	626	594	32
Oct.	2,316,858	75,900	7,831	583,151	575,281	3,400	43,347	46,475	696	677	19
Nov.	2,267,462	94,100	7,606	467,699	466,933	4,300	48,556	51,710	447	436	11
Dec.	2,417,841	83,600	8,058	422,985	424,233	1,300	42,248	46,887	331	321	10
Year	30,833,110	997,100	91,011	6,677,322	6,682,400	39,350	503,307	633,197	5,009	4,841	168
1935											
Jan.	2,801,552	88,000	8,267	437,442	438,334	1,075	48,831	52,565	329	300	29
Feb.	2,780,632	92,800	.....	404,203	402,928	.....	.....	.....	296	287	9
2 Mo.	5,582,184	180,800	.....	841,645	841,262	.....	.....	.....	625	587	38

*For public use.

Construction-Enterprise

(*Continued from Page 82*)

5203 Martin avenue, has been formed to deal in steel, by Charles H. Awkerman, 19304 Warrington street.

DETROIT—Hold Tite Mfg. Co. has been incorporaed to deal in chemicals, by Harold J. Curtis, 5901 Fourth avenue.

TECUMSEH, MICH.—H. Brewer & Co. has been incorporated with $25,000 capital to deal in machines, by R. K. Anderson, Tecumseh.

DETROIT—Motor City Electric Co. has been incorporated to deal in motors, by Fred Nelson, 132 Duffield street.

DETROIT — Superior Industries Corp., 19924 John R street, has been incorporated to deal in tools and dies by James D. Ligon, 167 Hollywood street.

DETROIT — American Metal Co. Ltd. of Michigan, 623 Cass avenue, has been organized with $50,000 capital to deal in lead, tin, and copper, by Malcolm A. MacIntyre, 205 East Sixty-ninth street, New York.

FILER CITY, MICH.—Falleen Drop Forge Co. has been granted RFC loan of $25,000 for improvements.

JACKSON, MICH.—Fox Machine Co. has been granted RFC loan of $75,000 for improvements.

MUSKEGON, MICH.—J. C. Penney Co. is planning to spend at least $60,000 to replace the building on Western avenue, damaged by fire two months ago. Plans are being prepared.

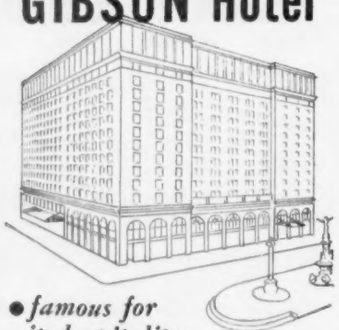
MUSKEGON, MICH. — Michigan Bakeries Inc. has started a $40,000 improvement program on its Market street building here. The program calls for remodeling, installation of new ovens, traveling tray-type equipment and new gas-fired boilers.

PONTIAC, MICH.—Inland Refineries Inc. will start construction soon of an oil refinery at Drayton Plains, Oakland county, to have a capacity of 1000 barrels of crude oil daily.

FAMOUS LANDMARKS

Washington has the CAPITOL

Cincinnati has the GIBSON Hotel



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●

Indiana

LAWRENCEBURG, IND. — Sheritt Saw Mfg. Co. Inc., 125 Third street, has been formed to manufacture saws and kindred articles, by Henry R. Sheritt, also resident agent, Morris McManaman and Mary M. Sheritt.

MISHAWAKA, IND.—Reorganization plan for the Dodge Mfg. Corp., Mishawaka, manufacturer of transmission machinery, approved by Judge Thomas W. Slick at South Bend, Ind., includes consolidation of a plant at Oneida, N. Y., with the Mishawaka plant.

Illinois

ALTON, ILL.—Midwest Wire & Paper Products Co. has been incorporated by Russell E. Keller, Nicholas J. Leonard and Leslie G. George, to manufacture and distribute articles or products of wire, paper and other materials. Correspondent: L. G. George, Edwardsville National Bank building, Edwardsville, Ill.

CHICAGO—Improvements in mechanical equipment are provided for in an appropriation of $250,000 for reopening the Great Lakes Naval Training station at Great Lakes, Ill., near here.

CHICAGO—Atlantic & Pacific Mining Co., 111 West Washington street, has been incorporated to deal in lead, copper, zinc, iron, steel, tungsten and all kinds of ores, metals and minerals, by E. G. Frawley, Albert Isaacson and Elaine Ducharme. Correspondent: Parker, Block, Clusman & Hague, 111 West Washington street.

CHICAGO—Paragon Cooperage Co., 160 North LaSalle street, has been incorporated by J. Kentner Elliott, Olive and William Kennedy, to manufacture kegs, barrels and other vessels. Correspondent: J. Kentner Elliott, 160 North LaSalle street.

CHICAGO—Sager Weatherstrip & Calking Corp., 35 South Dearborn street, has been incorporated by Robert Oehing, Willard Congreve and Douglas F. Bland, to manufacture and install metal weatherstrips for windows and doors. Correspondent: Robert Oehing, 35 South Dearborn street.

CHICAGO—Edwards Milk Products Co., 110 North Franklin street, has been incorporated to deal in machinery of all kinds for equipping creameries, by S. T. Edwards, D. E. Bell and O. M. Schiebel. Correspondent: McDonald & Richmond, 7 South Dearborn street.

CHICAGO—Premier Metal Works Inc., 1616 Burlington street, has been incorporated by Andrew Michyeta, John E. Juriss and John S. Kandel, to manufacture products incidental to sheet metal business. Correspondent: Simon A. Murray, 666 West Eighteenth street.

GALENA, ILL.—Galena Distillery Co., Sydney Haudenshield, Dubuque, Iowa, president, has awarded contract for construction of a 1-story addition to its distillery, 40 x 100 feet, to cost $30,000. New aging equipment will be installed.

District of Columbia

WASHINGTON—Bureau of supplies and accounts, navy department, will open bids April 5, schedule 4540, for corrosion-resisting steel, sheets, angles and strip; schedule 4545, for 4000 boiler tubes; April 12, schedule 4590, for rough-machined steel forgings.

Florida

MIAMI, FLA.—William Sydow, public service director, 3461 Main highway, is preparing detailed plans for construction of central sewage disposal plant.

Kentucky

LOUISVILLE, KY.—Coffey Distilling Co. has been incorporated with $50,000 capital by Ed. M. Seay, 1436 South Third street, and M. T. Coates.

MAYFIELD, KY.—City will vote on proposal to erect a power plant. Lloyd King and N. E. Holmes are on the committee studying this project.

Louisiana

ALEXANDRIA, LA.—City, commission counsel, will receive bids April 23 for certain equipment, material and labor for improvement to municipal power plant, consisting of two 500-horsepower boilers with superheaters and accessories, piping, and material for converting 1500 indoor meters into outdoor meters.

LOGANSPORT, LA.—City will soon call for bids for water works system, including a 50,000-gallon steel tank on a 100-foot steel tower, an all-steel pump house, an electric-driven direct connected service pump, flanged inlet pipe, etc. PWA loan of $43,000 has been granted.

Maryland

ANNAPOLIS, MD.—Annapolis metropolitan sewerage commission will receive bids April 9 for furnishing and installing pumping equipment and switchboard and chlorination equipment. Robert Barwell, engineer, Annapolis, Md.

BALTIMORE—Gunthers Brews, 1211 South Conkling street, is planning to build an addition to its plant at Conkling and Toone streets.

BALTIMORE—Charles R. Scrivener Co., 515 Mt. Holly street, has contract for alterations to the dairy at Preston and Wolfe streets for the Kress Farm Dairy, 2416 East North avenue. Owner will receive separate bids on equipment.

BALTIMORE—The old Patapsco Iron Works plant at 1200 Wicomico street, corner of Ostend street, has been leased by the Continental Equipment Co. The

building contains about 15,000 square feet of floor space.

NORTH EAST, MD.—Town commissioners are planning to construct a water supply, sanitary sewer system, storm drain and sewage treatment plant, to cost about $150,000.

North Carolina

CHARLOTTE, N. C.—Lance Packing Co., S. A. Van Every president, is planning to erect an addition to its plant, to increase capacity by one-third. Work will begin soon.

ROARING RIVER, N. C.—Roaring River Furniture Mfg. Co.'s plant recently sustained severe damages by fire.

South Carolina

CHARLESTON, S. C.—Navy department, H. L. Brinser rear admiral, United States navy, director of shore establishments, plans expending $153,000 for purchase of equipment for the navy yard here, including two boring bars, two embossing machines, a 14-inch gage bench-type shear, an 8-inch plate bending machine, a 10-inch portable deck planer, arc welding equipment, 26 acetylene cylinders, a 30-foot plate planer, and rotary shear and joggling rolls.

Tennessee

MEMPHIS, TENN.—City, Thomas H. Allen commissioner, will purchase and install two generators at the Parkway plant.

West Virginia

BENWOOD, W. VA.—The recently proposed plan of the Benwood Civic Improvement association for a municipal-owned electric power plant has been approved.

Virginia

CLAY BANK, VA.—Louis Groh is erecting a concrete building, 30 x 80 feet, for use as a barrel factory.

MINERAL, VA.—Town, J. E. Rowe mayor, will receive bids April 5 for construction of a waterworks system.

RICHMOND, VA.—Southern Railway is moving 60 per cent of its machine shops and foundry from South Richmond to Spencer, N. C., as an economy measure.

RICHMOND, VA.—Virginia Electric & Power Co., Seventh and Franklin streets, is planning to expend approximately $1,500,000 this year on new construction and improvements to its property. Major items include $45,000 for rebuilding street lighting systems, $40,000 for additional distribution facilities; $115,000 for additional voltage regulation to substation equipment; $75,000 for power station improvements and $55,000 for building bridges.

Missouri

TRENTON, MO.—Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo., is preparing plans and specifications for erection of light plant. Project involves diesel generation plant with approximately 1300 kilowatt capacity and distribution system. Cost is estimated at $325,000.

Arkansas

FORT SMITH, ARK.—City will take bids after May 1 for $1,500,000 new water supply system, consisting of an earth dam, 8,000,000-gallon filtration plant and approximately 23 miles of pipe line on which bids will be taken on concrete, steel and cast iron pipe. W. R. Holway, consulting engineer, Tulsa, Okla.

PORTLAND, ARK.—City clerk will soon ask bids for complete waterworks system. Firms interested should communicate with Hugh Carter, engineer, National Standard building, Little Rock, Ark., sending copy to city clerk at Portland.

Oklahoma

SHAWNEE, OKLA.—Power Grip Wrench Co. has been incorporated with $25,000 capital by Andy J. Morgan and Herbert J. Fox.

Wisconsin

DENMARK, WIS.—Denmark Brewing Co., J. O. Jorgensen president, plans erection of additional storage facilities and enlarging brewing plant.

ITASCA, WIS.—Chicago, St. Paul, Minneapolis & Omaha Railway Co. plans to rebuild its roundhouse recently damaged by fire.

SHEBOYGAN, WIS.—Badger State Tanning Co. plans remodeling and extensive alterations to factory buildings recently purchased, to cost about $25,000.

Minnesota

MINNEAPOLIS—Thorman W. Rosholt Co., distributor of contractor's equipment and industrial and mining machinery, has moved its office, shop and parts quarters from 928 South Fourth street to 3116-38 Snelling avenue.

ST. PAUL—Northern Pacific Railway Co. will soon start construction of a car shed, 106 x 730 feet for covering tracks at its freight yard in South Tacoma, Wash.

ST. PAUL—Herzog Iron Works, 812 Cypress street, has been incorporated with capital stock of $16,000 to take over and operate the plant of the old Herzog Iron Works. The new company will fabricate all types of ornamental metal work for use in building construction. George F. Siroky is president.

RUSSELL, MINN.—V. C. Johnson village clerk, will receive bids until April 5 for construction of a municipal waterworks system, including pump house and pumping equipment. Druar & Milinowski, 830 Globe building, St. Paul, engineers.

WINTHROP, MINN. — Minnesota Valley Canning Co., LeSueur, Minn., plans remodeling and extensive alterations to its canning factory here to cost about $25,000. Ralph W. Richardson, 116 East Fourth street, St. Paul, engineer.

Texas

BEAUMONT, TEX.—Seaboard Tankers Corp. and Seaboard Oil Co., Petroleum building, Houston, Tex., are planning to convert the old steamship DURHAM for use as a chemical plant, with daily capacity of 2000 barrels.

FORT WORTH, TEX.—Big Three Welding Equipment Co. has been incorporated with $12,000 capital, by Cyrus E. Rickel and Ben K. Smith, 4129 Pershing street.

LIBERTY, TEX.—City, F. S. Griffin mayor, is planning to erect a $125,000 power plant. J. H. Garrett, Garrett Engineering Co., 300 Hughes street, Houston, Tex., engineer.

MISSION, TEX.—Hidalgo water control and improvement district No. 6 has PWA loan and grant of $399,000 for installing an irrigation system here, requiring 2,000,000 square feet of canal lining and 211,000 feet of concrete pipe. E. M. McCard, engineer, Mission, Tex.

RIO GRANDE CITY, TEX.—Starr county water control and improvement district No. 1, S. B. Ricaby manager and project engineer, has PWA loan and grant of $1,250,000 for installing an irrigation system.

SAN JUAN, TEX.—Hidalgo county water control and improvement district No. 2 plans irrigation system improvements, including 1,870,000 square feet of concrete lining and concrete pipe

(*Please turn to Page 87*)

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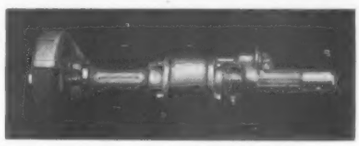

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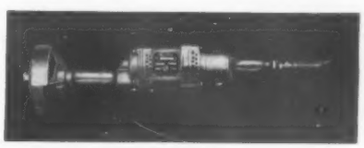

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Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
The Stanley Works, New Britain, Conn. Bridgeport, Conn.

BAR BENDERS
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.

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Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.
Youngstown Sheet & Tube Co., Youngstown, O.

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Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Laclede Steel Co., Arcade Bldg., St. Louis, Mo.
Midvale Co., The, Nicetown, Philadelphia, Pa.
Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
The Stanley Works, New Britain, Conn. Bridgeport, Conn.
Tennessee Coal, Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.
Timken Roller Bearing Co., The, Canton, O.
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BEAMS, CHANNELS, ANGLES, ETC.
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Weirton Steel Co., Weirton, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

BEARINGS (Ball)
Fafnir Bearing Co., New Britain, Conn.
New Departure Mfg. Co., Bristol, Conn.
S K F Industries, Inc., Front St. & Erie Ave., Philadelphia, Pa.

BEARINGS (Bronze)
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.
Cramp Brass & Iron Foundries Co., Paschall Sta., Philadelphia, Pa.
Shenango-Penn Mold Co., Dover, O.
Shoop Bronze Co., 344-54 W. 6th St., Tarentum, Pa.

BEARINGS (Journal)
Fafnir Bearing Co., New Britain, Conn.
Hyatt Roller Bearing Co., P. O. Box 476, Newark, N. J.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
S K F Industries, Inc., Front St. & Erie Ave., Philadelphia, Pa.
Timken Roller Bearing Co., The, Canton, O.

BEARINGS (Roller)
Fafnir Bearing Co., New Britain, Conn.
Hyatt Roller Bearing Co., P. O. Box 476, Newark, N. J.
S K F Industries, Inc., Front St. & Erie Ave., Philadelphia, Pa.
Timken Roller Bearing Co., The, Canton, O.

BEARINGS (Roll Neck)
Fafnir Bearing Co., New Britain, Conn.
Hyatt Roller Bearing Co., P. O. Box 476, Newark, N. J.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
S K F Industries, Inc., Front St. & Erie Ave., Philadelphia, Pa.
Timken Roller Bearing Co., Canton, O.

BEARINGS (Thrust)
Fafnir Bearing Co., New Britain, Conn.
S K F Industries, Inc., Front St. & Erie Ave., Philadelphia, Pa.
Timken Roller Bearing Co., The, Canton, O.

BENDING AND STRAIGHTENING MACHINES
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.
Morgan Engineering Co., The, Alliance, O.
Thomas Spacing Machine Co., Pittsburgh, Pa.

BENZOL AND TOLUOL RECOVERY PLANTS
Koppers Construction Co., 1438 Koppers Bldg., Pittsburgh.
Youngstown Sheet & Tube Co., Youngstown, O.

BILLETS (Alloy and Carbon Steel)
Alan Wood Steel Co., Conshohocken, Pa.
Andrews Steel Co., Newport, Ky.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. La Salle St., Chicago, Ill.
Republic Steel Corp., Youngstown, O.
The Stanley Works New Britain, Conn. Bridgeport, Conn.
Timken Steel & Tube Co., Canton, O.
Washburn Wire Co., Phillipsdale, R. I.

BILLETS (Forging)
Alan Wood Steel Co., Conshohocken, Pa.
Andrews Steel Co., Newport, Ky.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
Republic Steel Corp., Youngstown, O.
Standard Steel Works Co., Burnham, Pa.
The Stanley Works, New Britain, Conn. Bridgeport, Conn.
Timken Steel & Tube Co., Canton, O.

BILLETS AND BLOOMS
Alan Wood Steel Co., Conshohocken, Pa.
Andrews Steel Co., Newport, Ky.
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Republic Steel Corp., Youngstown, O.
Standard Steel Works Co., Burnham, Pa.
The Stanley Works, New Britain, Conn. Bridgeport, Conn.
Tennessee Coal, Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.
Timken Steel & Tube Co., Canton, O.
Youngstown Sheet & Tube Co., Youngstown, O.

BLAST FURNACE SPECIALTIES
Bailey, Wm. M., Co., 702 Magee Bldg., Pittsburgh, Pa.

BLAST FURNACES—See FURNACES (Blast)

BLOWERS
Coppus Engineering Co., 359 Park Ave., Worcester, Mass.
General Electric Co., Schenectady, N. Y.
Ingersoll-Rand Co., Phillipsburg, N. J.
Strong, Carlisle & Hammond Co., The, 1400 W. 3rd St., Cleveland, O.
Sturtevant, B. F., & Co., Hyde Park, Boston, Mass.

BOILER HEADS
Bethlehem Steel Co., Bethlehem, Pa.

BOILER TUBES—See TUBES (Boiler)

Construction-Enterprise

(*Concluded from Page* 85)

from 12-inch to 60-inch. PWA loan and grant of $1,769,000 has been approved.

Iowa

DENISON, IOWA—City plans installation of new 250-horsepower boiler in municipal light and power plant. Jacob Johnson is city clerk.

DES MOINES, IOWA—Iowa Alcohol Motor Fuel Co. has leased a site at East Fourteenth street and the Des Moines & Central Iowa railroad tracks and has begun erection of a plant for blending and distribution of alcohol motor fuel. The plant will have storage facilities of 75,000 gallons of gasoline and alcohol. F. A. Black is president.

Nebraska

BAYARD, NEBR.—Chimney Rock Power District is applying to PWA for a $400,000 grant and loan to finance rural electric lines in Morrill and Scottsbluff counties. Preliminary surveys are now being made by the district's engineers.

McCOOK, NEBR.—Town is contemplating a number of public improvements if congress makes new funds available for the PWA. Included would be a sewage disposal plant to cost $65,000, a city auditorium to cost $90,000 and an electric distribution system estimated at $100,000.

Colorado

DENVER, COLO.—Bureau of reclamation will take bids April 12, specification 617, for four 4-motor cage-operated, overhead revolving cranes for installation in the intake towers at Boulder Dam.

Pacific Coast

MARE ISLAND, CALIF.—Bureau of supplies and accounts, navy department, Washington, will take bids April 5, schedule 4598, for diesel engine driven generator equipment.

SANTA CRUZ, CALIF.—Titanium Alloy Mfg. Co., 111 Broadway, New York, is planning to construct a plant at Rob Roy Beach, near here, to manufacture titanium alloy steel from ore mined here. It is estimated that at least 4,000,000 tons of ore is available. A. J. Gaxiola is superintendent of construction.

DALLES, OREG.—Special election will be held April 30 to pass on proposed $200,000 bond issue to construct water terminals, for which $78,000 PWA funds are being sought.

PORTLAND, OREG.—United States engineer here will open bids April 5 for furnishing one 60,000-horsepower and one 5000-horsepower turbine, and governing equipment for the Bonneville power house.

SALEM, OREG.—Salem fish commission will receive bids April 3 for construction of refrigeration and utilities buildings, and insulation and refrigeration equipment for the Bonneville fisheries station. Claussen & Claussen, Guardian building, Portland, Oreg., are architects.

DAVENPORT, WASH. — Davenport Union Warehouse Co. is building a 16-bin, 100,000 bushel capacity frame elevator in which new equipment will be installed.

SEATTLE—Casein Mfg. Co., 701 Myrtle street, is building a blower house and installing new equipment.

SEATTLE—Northwest Steel Rolling Mills, 4315 Ninth avenue, Northwest, is building a steel storage frame warehouse, sheathed with corrugated sheets.

SEATTLE—Olympic View Winery association, Clyde Randall, president, plans construction of a 2-story plant at Alderwood Manor, Wash., to cost $12,000, including modern equipment and cold storage facilities.

SPOKANE—Chemical Corp. of Spokane has been incorporated with $50,000 capital. Papers were filed through Cannon, McKevitt & Fraser, Old National Bank building.

TONASKET, WASH.—Wenoka Cannery Co. is planning to increase its refrigerated space at its local plant.

YAKIMA, WASH.—City commission is considering erecting a diesel motor plant to generate power for street lighting and other municipal purposes.

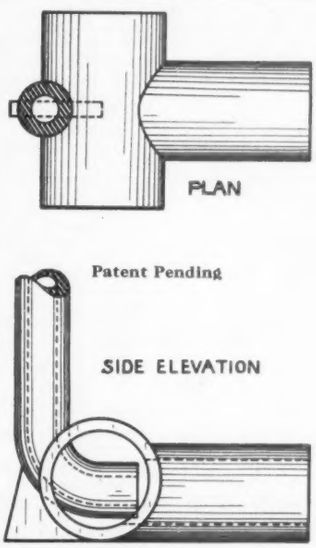
Dominion of Canada

KITCHENER, ONT.—Canada Skate Co. is planning to rebuild immediately its plant which recently was damaged by fire.

Alaska

JUNEAU, ALASKA—Bids for two engine compressors and two complete sets will be opened April 15 by W. C. Dibrell, superintendent, sixteenth lighthouse district.

SEWARD, ALASKA—City officials are in Washington seeking federal aid for a proposed 1000-horsepower hydroelectric plant estimated at $118,000 to be erected here. Plans have been prepared by Hubbell & Walters, Alaska building, Seattle.



Economy and more Uniform Heating for Pickling Baths-

is obtained by this new steam injector. The new fitting comprises a heavy walled T-shaped body of lead which lies flat and firmly on the bottom of the tank—see sketch.

In operation the acid is drawn in opposite directions through the openings at the ends of the cross-branch, is heated by the central steam jet and returned to the body of the bath.

Longer life on the walls of tank and injector is secured as the heat and acid are evenly distributed. Hammering or chattering is largely eliminated and breakage of the injector (lead) is minimized.

Details gladly furnished.

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Keystone Bldg. Pittsburgh, Pa.

For accurate screening of minerals, chemicals and all hard-to-screen materials. Special layouts and sizes to insure maximum production with minimum screening costs.

Wide selection of patterns for modern architectural grilles, panels, radiator covers. Tell us your specifications, and we will submit quotations and samples.

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New York Office, 114 Liberty Street

WHERE-TO-BUY

BOILERS
Babcock & Wilcox Co., The, 85 Liberty St., New York City.
Murray Iron Works Co., Burlington, Iowa.

BOLT AND NUT MACHINERY
Landis Machine Co., Waynesboro, Pa.
Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.

BOLT CLIPPERS
H. K. Porter, Inc., Everett, Mass.

BOLTS
Bethlehem Steel Co., Bethlehem, Pa.
Illinois Steel Co., 208 S. La Salle St., Chicago, Ill.
Jones & Laughlin Steel Co., Jones & Laughlin Bldg., Pittsburgh, Pa.
Oliver Iron & Steel Corp., S. 10th & Muriel Sts., Pittsburgh, Pa.
Republic Steel Corp., Upson Nut Div., 1912 Scranton Rd., Cleveland, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

BORING MACHINES (Horizontal)
Landis Tool Co., Waynesboro, Pa.

BOXES (Annealing)
United Engineering & Foundry Co., First National Bank Bldg., Pittsburgh, Pa.
Wilson, Lee, Engineering Co., 1370 Blount St., Cleveland, O.

BOXES (Case Hardening)
Strong, Carlisle & Hammond Co., The, 1400 W. 3rd St., Cleveland, O.

BOXES (Open Hearth Charging)
Morgan Engineering Co., The, Alliance, O.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

BRAKES (Electric)
Clark, The, Controller Co., 1146 E. 152nd St., Cleveland, O.
Cutler-Hammer, Inc., 1211 St. Paul Ave., Milwaukee, Wis.

BRICK—(Insulating)—See INSULATING BRICK

BRICK (Refractory)—See REFRACTORIES, CEMENT, DOLOMITE, etc.

BRICK (Silicon Carbide)
Carborundum Co., The, Perth Amboy, N. J.
Norton Co., Worcester, Mass.

BRIDGE CRANES (Ore and Coal Handling)
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

BRIDGES, BUILDINGS, VIADUCTS, STACKS
American Bridge Co., Frick Bldg., Pittsburgh, Pa.
Belmont Iron Works, 22nd and Washington Ave., Philadelphia, Pa.
Blaw Knox Co., Farmers Bank Bldg., Pittsburgh, Pa.
McClintic-Marshall Corp., Bethlehem, Pa.
Ohio Structural Steel Co., The, Newton Falls, O.
Truscon Steel Co., Youngstown, O.

BRUSHES (Motor and Generator)
Ohio Carbon Co., The, 12508 Berea Rd., Cleveland, O.

BUCKETS (Clam Shell, Dragline, Grab, Single Line)
Atlas Car & Mfg. Co., The, 1140 Ivanhoe Rd., Cleveland, O.
Blaw Knox Co., Farmers Bank Bldg., Pittsburgh, Pa.
Harnischfeger Corp., 4411 W. National Ave., Milwaukee, Wis.
Industrial Brownhoist Corp., Bay City, Mich.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

BUILDINGS (Steel)—See BRIDGES, ETC.

BULLDOZERS
Beatty Machine & Mfg. Co., Hammond, Ind.

BURNERS (Acetylene)—See TORCHES AND BURNERS

BURNERS (Automatic)
Surface Combustion Co., 2375 Dorr St., Toledo, O.
Wean Engineering Co., Warren, O.
Wilson, Lee, Engineering Co., 1370 Blount St., Cleveland, O.

BURNERS (Fuel, Oil, Gas, Combination)
Babcock & Wilcox Co., The, 85 Liberty St., New York City.
Shunk Mfg. Co., Bucyrus, O.
Surface Combustion Co., 2375 Dorr St., Toledo, O.
Wean Engineering Co., Warren, O.
Wilson, Lee, Engineering Co., 1370 Blount St., Cleveland, O.

BUSHINGS (Bronze)
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.
Gifford Engine Co., Lansing, Mich.
Shenango-Penn Mold Co., Dover, O.
Shoop Bronze Co., 344-54 W. 6th St., Tarentum, Pa.

BUSHINGS (Steel)
Danly Machine Specialties, Inc., 2147 So. 52nd St., Chicago, Ill.
Gifford Engine Co., Lansing, Mich.

BY-PRODUCT PLANTS
Koppers Construction Co., 1438 Koppers Bldg., Pittsburgh, Pa.

CADMIUM
The Udylite Co., 1615 E. Grand Blvd., Detroit, Mich.

CADMIUM PLATING PROCESS
The Udylite Co., 1615 E. Grand Blvd., Detroit, Mich.

CAR DUMPERS
Industrial Brownhoist Corp., Bay City, Mich.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

CAR PULLERS and SPOTTERS
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.

CARBIDE
Linde Air Products Co., 30 E. 42nd St., New York City.

CARBON (Brushes and Specialties)
Ohio Carbon Co., The, 12508 Berea Rd., Cleveland, O.

CARS (Charging)
Atlas Car & Mfg. Co., The, 1140 Ivanhoe Rd., Cleveland, O.
Morgan Engineering Co., The, Alliance, O.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

CARS (Industrial and Mining)
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland.
Bethlehem Steel Co., Bethlehem, Pa.

CARS (Scale)
Atlas Car & Mfg. Co., The, 1140 Ivanhoe Rd., Cleveland, O.

CASTERS
Lansing Co., Lansing, Mich.

CASTINGS (Acid Resisting)
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.
Chain Belt Co., 1660 W. Bruce St., Milwaukee, Wis.
Driver-Harris Co., Harrison, N. J.
International Nickel Co., Inc., 67 Wall St., New York City.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Shenango-Penn Mold Co., Dover, O.
Shoop Bronze Co., 344-54 W. 6th St., Tarentum, Pa.

CASTINGS (Alloy Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Pittsburgh Rolls Corp., 41st and Willow Sts., Pittsburgh, Pa.
Reliance Steel Casting Co., 2818 Smallman St., Pittsburgh, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Treadwell Engineering Co., Easton, Pa.
Union Steel Casting Co., 62nd & Butler Sts., Pittsburgh, Pa.
United Engineering & Fdry. Co., First National Bank Bldg., Pittsburgh, Pa.

CASTINGS (Brass, Bronze, Copper, Aluminum)
Aluminum Industries, Inc., 2348 Beekman St., Cincinnati, O.
Bethlehem Steel Co., Bethlehem, Pa.
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.
Cramp Brass & Iron Foundries Co., Paschall Sta., Philadelphia, Pa.
Morgan Engineering Co., The, Alliance, O.
Shenango-Penn Mold Co., Dover, O.
Shoop Bronze Co., 344-54 W. 6th St., Tarentum, Pa.

CASTINGS (Electric Steel)
West Steel Casting Co., 805 E. 70th St., Cleveland, O.

CASTINGS (Gray Iron, Alloy, or Semi-Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Chain Belt Co., 1660 W. Bruce St., Milwaukee, Wis.
Cramp Brass & Iron Foundries Co., Paschall Sta., Philadelphia, Pa.
Erie Foundry Co., Erie, Pa.
Forest City Foundries Co., 2500 W. 27th St., Cleveland, O.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Midvale Co., The, Nicetown, Philadelphia, Pa.
Murray Iron Works, Burlington, Iowa.
National Roll & Foundry Co., The, Avonmore, Pa.
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.
Treadwell Engineering Co., Easton, Pa.

CASTINGS (Heat Resisting)
Driver-Harris Co., Harrison, N. J.

CASTINGS (Malleable)
Chain Belt Co., 1660 W. Bruce St., Milwaukee, Wis.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Peoria Malleable Castings Co., Peoria, Ill.

CASTINGS (Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Mackintosh-Hemphill Co., 9th & Bingham Sts., Pittsburgh.
Mesta Machine Co., P. O. Box 1124, Pittsburgh, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
National Roll & Foundry Co., The, Avonmore, Pa.
Pittsburgh Rolls Corp., 41st and Willow Sts., Pittsburgh, Pa.
Reliance Steel Casting Co., 2818 Smallman St., Pittsburgh, Pa.
Standard Steel Works Co., Burnham, Pa.
Strong Steel Foundry Co., 33 Norris Ave., Buffalo, N. Y.
Treadwell Engineering Co., Easton, Pa.
Union Steel Casting Co., 62nd & Butler Sts., Pittsburgh, Pa.
United Engineering & Fdry. Co., First National Bank Bldg., Pittsburgh, Pa.
West Steel Casting Co., 805 E. 70th St., Cleveland, O.

CASTINGS (Worm & Gear Bronze)
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.

CEMENT (High Temperature)
Carborundum Co., The, Perth Amboy, N. J.
Norton Company, Worcester, Mass.
Strong, Carlisle & Hammond Co., The, 1400 W. 3rd St., Cleveland.

CHAIN (Draw Bench)
Chain Belt Co., 1660 W. Bruce St., Milwaukee, Wis.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.

CHAIN (Malleable)
Chain Belt Co., 1660 W. Bruce St., Milwaukee, Wis.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.

CHAIN (Sprocket)
Chain Belt Co., 1660 W. Bruce St., Milwaukee, Wis.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Peoria Malleable Castings Co., Peoria, Ill.

CHAIN (Steel-Finished Roller)
Chain Belt Co., 1660 W. Bruce St., Milwaukee, Wis.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.

CHARGING MACHINES (Cupola)
Atlas Car & Mfg. Co., The, 1140 Ivanhoe Rd., Cleveland, O.
Morgan Engineering Co., The, Alliance, O.

CHARGING MACHINES (Open Hearth)
Morgan Engineering Co., The, Alliance, O.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

CHECKS (Metal)
Cunningham, M. E., Co., 107 E. Carson St., Pittsburgh, Pa.

CHECKS & BADGES (Metal)
Dickey-Grabler Co., The, 10302 Madison Ave., Cleveland, O.

CHISEL BLANKS
Pittsburgh Tool, Knife & Mfg. Co., 7501 Thomas Blvd., Pittsburgh, Pa.

CHROME ORE
Samuel, Frank, & Co., Inc., Harrison Bldg., Philadelphia.

CHROMIUM METAL
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.

CLEANING SPECIALTIES
American Chemical Paint Co., Ambler, Pa.

CLUTCHES (Magnetic)
Magnetic Mfg. Co., Dept. TL, 650 So. 28th St., Milwaukee, Wis.

COAL AND COKE
Alan Wood Steel Co., Conshohocken, Pa.
Cleveland-Cliffs Iron Co., Union Trust Bldg., Cleveland, O.
Hanna Furnace Corp., The, Detroit, Mich.
Interlake Iron Corp., Union Trust Bldg., Cleveland, O.
Pickands, Mather & Co., Union Trust Bldg., Cleveland, O.
Shenango Furnace Co., Oliver Bldg., Pittsburgh, Pa.
Tennessee Coal, Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.
Youngstown Sheet & Tube Co., Youngstown, O.

COAL, ORE AND ASH HANDLING MACHINERY
Atlas Car & Mfg. Co., The, 1140 Ivanhoe Rd., Cleveland, O.
Industrial Brownhoist Corp., Bay City, Mich.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.

COKE—See COAL AND COKE

COKE OVEN MACHINERY
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland, O.
Morgan Engineering Co., The, Alliance, O.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

COKE OVENS (By-Product)
Koppers Construction Co., 1438 Koppers Bldg., Pittsburgh.

COMBUSTION BULBS
Norton Company, Worcester, Mass.

COMPRESSORS (Air)
Chicago Pneumatic Tool Co., 6 East 44th St., New York City.
Curtis Pneumatic Machinery Co., 1996 Kienlen Ave., St. Louis, Mo.
General Electric Co., Schenectady, N. Y.
Ingersoll-Rand Co., Phillipsburg, N. J.
Worthington Pump & Compressor Corp., Harrison, N. J.

CONCRETE REINFORCING BARS—See BARS (Concrete Reinforcing)